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(51) International Patent Classification ⁷ : C12N 15/12, C07K 14/47, C12N 5/10, C07K 16/18, C12N 15/62, C12Q 1/68, G01N 33/50, 33/53, A61K 38/02, 48/00	A2	(11) International Publication Number: WO 00/37643 (43) International Publication Date: 29 June 2000 (29.06.00)															
(21) International Application Number: PCT/US99/30909 (22) International Filing Date: 23 December 1999 (23.12.99) (30) Priority Data: <table border="0"> <tr> <td>09/221,298</td> <td>23 December 1998 (23.12.98)</td> <td>US</td> </tr> <tr> <td>09/347,496</td> <td>2 July 1999 (02.07.99)</td> <td>US</td> </tr> <tr> <td>09/401,064</td> <td>22 September 1999 (22.09.99)</td> <td>US</td> </tr> <tr> <td>09/444,242</td> <td>19 November 1999 (19.11.99)</td> <td>US</td> </tr> <tr> <td>09/454,150</td> <td>2 December 1999 (02.12.99)</td> <td>US</td> </tr> </table> (71) Applicant (for all designated States except US): CORIXA CORPORATION [US/US]; Suite 200, 1124 Columbia Street, Seattle, WA 98104 (US). (72) Inventors; and (75) Inventors/Applicants (for US only): XU, Jiangchun [US/US]; 15805 SE 43rd Place, Bellevue, WA 98006 (US). LODES, Michael, J. [US/US]; 9223 - 36th Avenue SW, Seattle, WA 98126 (US). SECRIST, Heather [US/US]; 3844 - 35th Avenue West, Seattle, WA 98199 (US). BENSON, Darin, R. [US/US]; 723 N. 48th Street, Seattle, WA 98104 (US). MEAGHER, Madeleine, Joy [US/US]; 3819 Interlake Avenue N., Seattle, WA 98103 (US). STOLK, John [US/US]; 7436 NE 144th Place, Bothell, WA 98011		09/221,298	23 December 1998 (23.12.98)	US	09/347,496	2 July 1999 (02.07.99)	US	09/401,064	22 September 1999 (22.09.99)	US	09/444,242	19 November 1999 (19.11.99)	US	09/454,150	2 December 1999 (02.12.99)	US	(US). WANG, Tongtong [CN/US]; 8049 NE 28th Street, Medina, WA 98039 (US). YUQIU, Jiang [CN/US]; 5001 South 232nd Street, Kent, WA 98032 (US). (74) Agents: MAKI, David, J. et al.; Seed and Berry LLP, Suite 6300, 701 Fifth Avenue, Seattle, WA 98104-7092 (US). (81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>Without international search report and to be republished upon receipt of that report.</i>
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(54) Title: COMPOUNDS FOR IMMUNOTHERAPY AND DIAGNOSIS OF COLON CANCER AND METHODS FOR THEIR USE (57) Abstract <p>Compositions and methods for the therapy and diagnosis of cancer, such as colon cancer, are disclosed. Compositions may comprise one or more colon tumor proteins, immunogenic portions thereof, or polynucleotides that encode such portions. Alternatively, a therapeutic composition may comprise an antigen presenting cell that expresses a colon tumor protein, or a T cell that is specific for cells expressing such a protein. Such compositions may be used, for example, for the prevention and treatment of diseases such as colon cancer. Diagnostic methods based on detecting a colon tumor protein, or mRNA encoding such a protein, in a sample are also provided.</p>																	

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COMPOUNDS FOR IMMUNOTHERAPY AND DIAGNOSIS OF COLON CANCER AND METHODS FOR THEIR USE

TECHNICAL FIELD

5 The present invention relates generally to therapy and diagnosis of cancer, such as colon cancer. The invention is more specifically related to polypeptides comprising at least a portion of a colon tumor protein, and to polynucleotides encoding such polypeptides. Such polypeptides and polynucleotides may be used in vaccines and pharmaceutical compositions for prevention and treatment of colon cancer, and for the
10 diagnosis and monitoring of such cancers.

BACKGROUND OF THE INVENTION

Cancer is a significant health problem throughout the world. Although advances have been made in detection and therapy of cancer, no vaccine or other universally successful method for prevention or treatment is currently available. Current therapies, which
15 are generally based on a combination of chemotherapy or surgery and radiation, continue to prove inadequate in many patients.

Colon cancer is the second most frequently diagnosed malignancy in the United States as well as the second most common cause of cancer death. An estimated 95,600 new cases of colon cancer will be diagnosed in 1998, with an estimated 47,700 deaths.
20 The five-year survival rate for patients with colorectal cancer detected in an early localized stage is 92%; unfortunately, only 37% of colorectal cancer is diagnosed at this stage. The survival rate drops to 64% if the cancer is allowed to spread to adjacent organs or lymph nodes, and to 7% in patients with distant metastases.

The prognosis of colon cancer is directly related to the degree of penetration of
25 the tumor through the bowel wall and the presence or absence of nodal involvement, consequently, early detection and treatment are especially important. Currently, diagnosis is aided by the use of screening assays for fecal occult blood, sigmoidoscopy, colonoscopy and double contrast barium enemas. Treatment regimens are determined by the type and stage of the cancer, and include surgery, radiation therapy and/or chemotherapy. Recurrence
30 following surgery (the most common form of therapy) is a major problem and is often the

ultimate cause of death. In spite of considerable research into therapies for the disease, colon cancer remains difficult to diagnose and treat. In spite of considerable research into therapies for these and other cancers, colon cancer remains difficult to diagnose and treat effectively. Accordingly, there is a need in the art for improved methods for detecting and treating such cancers. The present invention fulfills these needs and further provides other related advantages.

SUMMARY OF THE INVENTION

Briefly stated, the present invention provides compositions and methods for the diagnosis and therapy of cancer, such as colon cancer. In one aspect, the present invention provides polypeptides comprising at least a portion of a colon tumor protein, or a variant thereof. Certain portions and other variants are immunogenic, such that the ability of the variant to react with antigen-specific antisera is not substantially diminished. Within certain embodiments, the polypeptide comprises a sequence that is encoded by a polynucleotide sequence selected from the group consisting of: (a) sequences recited in SEQ ID NO: 1-121, 123-197 and 205-486; (b) variants of a sequence recited in SEQ ID NO: 1-121, 123-197 and 205-486; and (c) complements of a sequence of (a) or (b).

The present invention further provides polynucleotides that encode a polypeptide as described above, or a portion thereof (such as a portion encoding at least 15 amino acid residues of a colon tumor protein), expression vectors comprising such polynucleotides and host cells transformed or transfected with such expression vectors.

Within other aspects, the present invention provides pharmaceutical compositions comprising a polypeptide or polynucleotide as described above and a physiologically acceptable carrier.

Within a related aspect of the present invention, vaccines are provided. Such vaccines comprise a polypeptide or polynucleotide as described above and an immunostimulant.

The present invention further provides pharmaceutical compositions that comprise: (a) an antibody or antigen-binding fragment thereof that specifically binds to a colon tumor protein; and (b) a physiologically acceptable carrier.

Within further aspects, the present invention provides pharmaceutical compositions comprising: (a) an antigen presenting cell that expresses a polypeptide as described above and (b) a pharmaceutically acceptable carrier or excipient. Antigen presenting cells include dendritic cells, macrophages, monocytes, fibroblasts and B cells.

5 Within related aspects, vaccines are provided that comprise: (a) an antigen presenting cell that expresses a polypeptide as described above and (b) an immunostimulant.

The present invention further provides, in other aspects, fusion proteins that comprise at least one polypeptide as described above, as well as polynucleotides encoding such fusion proteins.

10 Within related aspects, pharmaceutical compositions comprising a fusion protein, or a polynucleotide encoding a fusion protein, in combination with a physiologically acceptable carrier are provided.

Vaccines are further provided, within other aspects, that comprise a fusion protein, or a polynucleotide encoding a fusion protein, in combination with an
15 immunostimulant.

Within further aspects, the present invention provides methods for inhibiting the development of a cancer in a patient, comprising administering to a patient a pharmaceutical composition or vaccine as recited above.

The present invention further provides, within other aspects, methods for
20 removing tumor cells from a biological sample, comprising contacting a biological sample with T cells that specifically react with a colon tumor protein, wherein the step of contacting is performed under conditions and for a time sufficient to permit the removal of cells expressing the protein from the sample.

Within related aspects, methods are provided for inhibiting the development of
25 a cancer in a patient, comprising administering to a patient a biological sample treated as described above.

Methods are further provided, within other aspects, for stimulating and/or expanding T cells specific for a colon tumor protein, comprising contacting T cells with one or more of: (i) a polypeptide as described above; (ii) a polynucleotide encoding such a
30 polypeptide; and/or (iii) an antigen presenting cell that expresses such a polypeptide; under

conditions and for a time sufficient to permit the stimulation and/or expansion of T cells. Isolated T cell populations comprising T cells prepared as described above are also provided.

Within further aspects, the present invention provides methods for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective
5 amount of a T cell population as described above.

The present invention further provides methods for inhibiting the development of a cancer in a patient, comprising the steps of: (a) incubating CD4⁺ and/or CD8⁺ T cells isolated from a patient with one or more of: (i) a polypeptide comprising at least an immunogenic portion of a colon tumor protein; (ii) a polynucleotide encoding such a
10 polypeptide; and (iii) an antigen-presenting cell that expresses such a polypeptide; and (b) administering to the patient an effective amount of the proliferated T cells, and thereby inhibiting the development of a cancer in the patient. Proliferated cells may, but need not, be cloned prior to administration to the patient.

Within further aspects, the present invention provides methods for determining
15 the presence or absence of a cancer in a patient, comprising: (a) contacting a biological sample obtained from a patient with a binding agent that binds to a polypeptide as recited above; (b) detecting in the sample an amount of polypeptide that binds to the binding agent; and (c) comparing the amount of polypeptide with a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient. Within preferred
20 embodiments, the binding agent is an antibody, more preferably a monoclonal antibody. The cancer may be colon cancer.

The present invention also provides, within other aspects, methods for monitoring the progression of a cancer in a patient. Such methods comprise the steps of: (a) contacting a biological sample obtained from a patient at a first point in time with a binding
25 agent that binds to a polypeptide as recited above; (b) detecting in the sample an amount of polypeptide that binds to the binding agent; (c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and (d) comparing the amount of polypeptide detected in step (c) with the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

30 The present invention further provides, within other aspects, methods for determining the presence or absence of a cancer in a patient, comprising the steps of: (a)

contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a colon tumor protein; (b) detecting in the sample a level of a polynucleotide, preferably mRNA, that hybridizes to the oligonucleotide; and (c) comparing the level of polynucleotide that hybridizes to the oligonucleotide with a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient. Within certain embodiments, the amount of mRNA is detected via polymerase chain reaction using, for example, at least one oligonucleotide primer that hybridizes to a polynucleotide encoding a polypeptide as recited above, or a complement of such a polynucleotide. Within other embodiments, the amount of mRNA is detected using a hybridization technique, employing an oligonucleotide probe that hybridizes to a polynucleotide that encodes a polypeptide as recited above, or a complement of such a polynucleotide.

In related aspects, methods are provided for monitoring the progression of a cancer in a patient, comprising the steps of: (a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a colon tumor protein; (b) detecting in the sample an amount of a polynucleotide that hybridizes to the oligonucleotide; (c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and (d) comparing the amount of polynucleotide detected in step (c) with the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

Within further aspects, the present invention provides antibodies, such as monoclonal antibodies, that bind to a polypeptide as described above, as well as diagnostic kits comprising such antibodies. Diagnostic kits comprising one or more oligonucleotide probes or primers as described above are also provided.

These and other aspects of the present invention will become apparent upon reference to the following detailed description and attached figures. All references disclosed herein are hereby incorporated by reference in their entirety as if each was incorporated individually.

SEQUENCE IDENTIFIERS

SEQ ID NO: 1 is a first determined cDNA sequence for Contig 1, showing homology to Neutrophil Gelatinase Associated Lipocalin.

SEQ ID NO: 2 is the determined cDNA sequence for Contig 2, showing no significant homology to any known genes.

SEQ ID NO: 3 is the determined cDNA sequence for Contig 4, showing homology to Carcinoembryonic antigen.

5 SEQ ID NO: 4 is the determined cDNA sequence for Contig 5, showing homology to Carcinoembryonic antigen.

SEQ ID NO: 5 is the determined cDNA sequence for Contig 9, showing homology to Carcinoembryonic antigen.

10 SEQ ID NO: 6 is the determined cDNA sequence for Contig 52, showing homology to Carcinoembryonic antigen.

SEQ ID NO: 7 is the determined cDNA sequence for Contig 6, showing homology to Villin.

SEQ ID NO: 8 is the determined cDNA sequence for Contig 8, showing no significant homology to any known genes.

15 SEQ ID NO: 9 is the determined cDNA sequence for Contig 10, showing homology to Transforming Growth Factor (BIGH3).

SEQ ID NO: 10 is the determined cDNA sequence for Contig 19, showing homology to Transforming Growth Factor (BIGH3).

20 SEQ ID NO: 11 is the determined cDNA sequence for Contig 21, showing homology to Transforming Growth Factor (BIGH3).

SEQ ID NO: 12 is the determined cDNA sequence for Contig 11, showing homology to CO-029.

SEQ ID NO: 13 is the determined cDNA sequence for Contig 55, showing homology to CO-029.

25 SEQ ID NO: 14 is the determined cDNA sequence for Contig 12, showing homology to Chromosome 17, clone hRPC.1171_I_10, also referred to as C798P.

SEQ ID NO: 15 is the determined cDNA sequence for Contig 13, showing no significant homology to any known gene.

30 SEQ ID NO: 16 is the determined cDNA sequence for Contig 14, also referred to as 14261, showing no significant homology to any known gene.

SEQ ID NO: 17 is the determined cDNA sequence for Contig 15, showing homology to Ets-Related Transcription Factor (ERT).

SEQ ID NO: 18 is the determined cDNA sequence for Contig 16, showing homology to Chromosome 5, PAC clone 228g9 (LBNL H142).

5 SEQ ID NO: 19 is the determined cDNA sequence for Contig 24, showing homology to Chromosome 5, PAC clone 228g9 (LBNL H142).

SEQ ID NO: 20 is the determined cDNA sequence for Contig 17, showing homology to Cytokeratin.

10 SEQ ID NO: 21 is the determined cDNA sequence for Contig 18, showing homology to L1-Cadherin.

SEQ ID NO: 22 is the determined cDNA sequence for Contig 20, showing no significant homology to any known gene.

SEQ ID NO: 23 is the determined cDNA sequence for Contig 22, showing homology to Bumetanide-sensitive Na-K-Cl cotransporter (NKCC1).

15 SEQ ID NO: 24 is the determined cDNA sequence for Contig 23, showing no significant homology to any known gene.

SEQ ID NO: 25 is the determined cDNA sequence for Contig 25, showing homology to Macrophage Inflammatory Protein 3 alpha.

20 SEQ ID NO: 26 is the determined cDNA sequence for Contig 26, showing homology to Laminin.

SEQ ID NO: 27 is the determined cDNA sequence for Contig 48, showing homology to Laminin.

SEQ ID NO: 28 is the determined cDNA sequence for Contig 27, showing homology to Mytobularin (MTM1).

25 SEQ ID NO: 29 is the determined cDNA sequence for Contig 28, showing homology to Chromosome 16 BAC clone CIT987SK-A-363E6.

SEQ ID NO: 30 is the determined cDNA sequence for Contig 29, also referred to as C751P and 14247, showing no significant homology to any known gene, but partial homology to Rat GSK-3 β -interacting protein Axil homolog.

30 SEQ ID NO: 31 is the determined cDNA sequence for Contig 30, showing homology to Zinc Finger Transcription Factor (ZNF207).

SEQ ID NO: 32 is the determined cDNA sequence for Contig 31, showing no significant homology to any known gene, but partial homology to Mus musculus GOB-4 homolog.

5 SEQ ID NO: 33 is the determined cDNA sequence for Contig 35, showing no significant homology to any known gene, but partial homology to Mus musculus GOB-4 homolog.

SEQ ID NO: 34 is the determined cDNA sequence for Contig 32, showing no significant homology to any known gene.

10 SEQ ID NO: 35 is the determined cDNA sequence for Contig 34, showing homology to Desmoglein 2.

SEQ ID NO: 36 is the determined cDNA sequence for Contig 36, showing no significant homology to any known gene.

SEQ ID NO: 37 is the determined cDNA sequence for Contig 37, showing homology to Putative Transmembrane Protein.

15 SEQ ID NO: 38 is the determined cDNA sequence for Contig 38, also referred to as C796P and 14219, showing no significant homology to any known gene.

SEQ ID NO: 39 is the determined cDNA sequence for Contig 40, showing homology to Nonspecific Cross-reacting Antigen.

20 SEQ ID NO: 40 is the determined cDNA sequence for Contig 41, also referred to as C799P and 14308, showing no significant homology to any known gene.

SEQ ID NO: 41 is the determined cDNA sequence for Contig 42, also referred to as C794P and 14309, showing no significant homology to any known gene.

SEQ ID NO: 42 is the determined cDNA sequence for Contig 43, showing homology to Chromosome 1 specific transcript KIAA0487.

25 SEQ ID NO: 43 is the determined cDNA sequence for Contig 45, showing homology to hMCM2.

SEQ ID NO: 44 is the determined cDNA sequence for Contig 46, showing homology to ETS2.

30 SEQ ID NO: 45 is the determined cDNA sequence for Contig 49, showing homology to Pump-1.

SEQ ID NO: 46 is the determined cDNA sequence for Contig 50, also referred to as C792P and 18323, showing no significant homology to any known gene.

SEQ ID NO: 47 is the determined cDNA sequence for Contig 51, also referred to as C795P and 14317, showing no significant homology to any known gene.

5 SEQ ID NO: 48 is the determined cDNA sequence for 11092, showing no significant homology to any known gene.

SEQ ID NO: 49 is the determined cDNA sequence for 11093, showing no significant homology to any known gene.

10 SEQ ID NO: 50 is the determined cDNA sequence for 11094, showing homology to Human Putative Enterocyte Differentiation Protein.

SEQ ID NO: 51 is the determined cDNA sequence for 11095, showing homology to Human Transcriptional Corepressor hKAP1/TIF1B mRNA.

SEQ ID NO: 52 is the determined cDNA sequence for 11096, showing no significant homology to any known gene.

15 SEQ ID NO: 53 is the determined cDNA sequence for 11097, showing homology to Human Nonspecific Antigen.

SEQ ID NO: 54 is the determined cDNA sequence for 11098, showing no significant homology to any known gene.

20 SEQ ID NO: 55 is the determined cDNA sequence for 11099, showing homology to Human Pancreatic Secretory Inhibitor (PST) mRNA.

SEQ ID NO: 56 is the determined cDNA sequence for 11186, showing homology to Human Pancreatic Secretory Inhibitor (PST) mRNA.

SEQ ID NO: 57 is the determined cDNA sequence for 11101, showing homology to Human Chromosome X.

25 SEQ ID NO: 58 is the determined cDNA sequence for 11102, showing homology to Human Chromosome X.

SEQ ID NO: 59 is the determined cDNA sequence for 11103, showing no significant homology to any known gene.

30 SEQ ID NO: 60 is the determined cDNA sequence for 11174, showing no significant homology to any known gene.

SEQ ID NO: 61 is the determined cDNA sequence for 11104, showing homology to Human mRNA for KIAA0154.

SEQ ID NO: 62 is the determined cDNA sequence for 11105, showing homology to Human Apurinic/Apyrimidinic Endonuclease (hap1)mRNA.

5 SEQ ID NO: 63 is the determined cDNA sequence for 11106, showing homology to Human Chromosome 12p13.

SEQ ID NO: 64 is the determined cDNA sequence for 11107, showing homology to Human 90 kDa Heat Shock Protein.

10 SEQ ID NO: 65 is the determined cDNA sequence for 11108, showing no significant homology to any known gene.

SEQ ID NO: 66 is the determined cDNA sequence for 11112, showing no significant homology to any known gene.

SEQ ID NO: 67 is the determined cDNA sequence for 11115, showing no significant homology to any known gene.

15 SEQ ID NO: 68 is the determined cDNA sequence for 11117, showing no significant homology to any known gene.

SEQ ID NO: 69 is the determined cDNA sequence for 11118, showing no significant homology to any known gene.

20 SEQ ID NO: 70 is the determined cDNA sequence for 11119, showing homology to Human Elongation Factor 1-alpha.

SEQ ID NO: 71 is the determined cDNA sequence for 11121, showing homology to Human Lamin B Receptor (LBR) mRNA.

SEQ ID NO: 72 is the determined cDNA sequence for 11122, showing homology to H. sapiens mRNA for Novel Glucocorticoid.

25 SEQ ID NO: 73 is the determined cDNA sequence for 11123, showing homology to H. sapiens mRNA for snRNP protein B.

SEQ ID NO: 74 is the determined cDNA sequence for 11124, showing homology to Human Cisplatin Resistance Associated Beta-protein.

30 SEQ ID NO: 75 is the determined cDNA sequence for 11127, showing homology to M. musculus Calumenin mRNA.

SEQ ID NO: 76 is the determined cDNA sequence for 11128, showing homology to Human ras-related small GTP binding protein.

SEQ ID NO: 77 is the determined cDNA sequence for 11130, showing homology to Human Cosmid U169d2.

5 SEQ ID NO: 78 is the determined cDNA sequence for 11131, showing homology to H. sapiens mRNA for protein homologous to Elongation 1-g.

SEQ ID NO: 79 is the determined cDNA sequence for 11134, showing no significant homology to any known gene.

10 SEQ ID NO: 80 is the determined cDNA sequence for 11135, showing homology to H. sapiens Nieman-Pick (NPC1) mRNA.

SEQ ID NO: 81 is the determined cDNA sequence for 11137, showing homology to H. sapiens mRNA for Niecin b-chain.

SEQ ID NO: 82 is the determined cDNA sequence for 11138, showing homology to Human Endogenous Retroviral Protease mRNA.

15 SEQ ID NO: 83 is the determined cDNA sequence for 11139, showing homology to H. sapiens mRNA for DMBT1 protein.

SEQ ID NO: 84 is the determined cDNA sequence for 11140, showing homology to H. sapiens ras GTPase activating-like protein.

20 SEQ ID NO: 85 is the determined cDNA sequence for 11143, showing homology to Human Acidic Ribosomal Phosphoprotein PO mRNA.

SEQ ID NO: 86 is the determined cDNA sequence for 11144, showing homology to H. sapiens U21 mRNA.

SEQ ID NO: 87 is the determined cDNA sequence for 11145, showing homology to Human GTP-binding protein.

25 SEQ ID NO: 88 is the determined cDNA sequence for 11148, showing homology to H. sapiens U21 mRNA.

SEQ ID NO: 89 is the determined cDNA sequence for 11151, showing no significant homology to any known gene.

30 SEQ ID NO: 90 is the determined cDNA sequence for 11154, showing no significant homology to any known gene.

SEQ ID NO: 91 is the determined cDNA sequence for 11156, showing homology to H. sapiens Ribosomal Protein L27.

SEQ ID NO: 92 is the determined cDNA sequence for 11157, showing homology to H. sapiens Ribosomal Protein L27.

5 SEQ ID NO: 93 is the determined cDNA sequence for 11158, showing no significant homology to any known gene.

SEQ ID NO: 94 is the determined cDNA sequence for 11162, showing homology to Ag-X antigen.

10 SEQ ID NO: 95 is the determined cDNA sequence for 11164, showing homology to H. sapiens mRNA for Signal Recognition Protein sub14.

SEQ ID NO: 96 is the determined cDNA sequence for 11165, showing homology to Human PAC 204e5/127h14.

SEQ ID NO: 97 is the determined cDNA sequence for 11166, showing homology to Human mRNA for KIAA0108.

15 SEQ ID NO: 98 is the determined cDNA sequence for 11167, showing homology to H. sapiens mRNA for Neutrophil Gelatinase asst. Lipocalin.

SEQ ID NO: 99 is the determined cDNA sequence for 11168, showing no significant homology to any known gene.

20 SEQ ID NO: 100 is the determined cDNA sequence for 11172, showing no significant homology to any known gene.

SEQ ID NO: 101 is the determined cDNA sequence for 11175, showing no significant homology to any known gene.

SEQ ID NO: 102 is the determined cDNA sequence for 11176, showing homology to Human maspin mRNA.

25 SEQ ID NO: 103 is the determined cDNA sequence for 11177, showing homology to Human Carcinoembryonic Antigen.

SEQ ID NO: 104 is the determined cDNA sequence for 11178, showing homology to Human A-Tubulin mRNA.

30 SEQ ID NO: 105 is the determined cDNA sequence for 11179, showing homology to Human mRNA for proton-ATPase-like protein.

SEQ ID NO: 106 is the determined cDNA sequence for 11180, showing homology to Human HepG2 3' region cDNA clone hmd.

SEQ ID NO: 107 is the determined cDNA sequence for 11182, showing homology to Human MHC homologous to Chicken B-Complex Protein.

5 SEQ ID NO: 108 is the determined cDNA sequence for 11183, showing homology to Human High Mobility Group Box (SSRP1) mRNA.

SEQ ID NO: 109 is the determined cDNA sequence for 11184, showing no significant homology to any known gene.

10 SEQ ID NO: 110 is the determined cDNA sequence for 11185, showing no significant homology to any known gene.

SEQ ID NO: 111 is the determined cDNA sequence for 11187, showing no significant homology to any known gene.

SEQ ID NO: 112 is the determined cDNA sequence for 11190, showing homology to Human Replication Protein A 70kDa.

15 SEQ ID NO: 113 is the determined cDNA sequence for Contig 47, also referred to as C797P, showing homology to Human Chromosome X clone bW XD342.

SEQ ID NO: 114 is the determined cDNA sequence for Contig 7, showing homology to Equilibrative Nucleoside Transporter 2 (ent2).

20 SEQ ID NO: 115 is the determined cDNA sequence for 14235.1, also referred to as C791P, showing homology to H. sapiens chromosome 21 derived BAC containing ets-2 gene.

SEQ ID NO: 116 is the determined cDNA sequence for 14287.2, showing no significant homology to any known gene, but some degree of homology to Putative Transmembrane Protein.

25 SEQ ID NO: 117 is the determined cDNA sequence for 14233.1, also referred to as Contig 48, showing no significant homology to any known gene.

SEQ ID NO: 118 is the determined cDNA sequence for 14298.2, also referred to as C793P, showing no significant homology to any known gene.

30 SEQ ID NO: 119 is the determined cDNA sequence for 14372, also referred to as Contig 44, showing no significant homology to any known gene.

SEQ ID NO: 120 is the determined cDNA sequence for 14295, showing homology to secreted cement gland protein XAG-2 homolog.

SEQ ID NO: 121 is the determined full-length cDNA sequence for a clone showing homology to Beta IG-H3.

5 SEQ ID NO: 122 is the predicted amino acid sequence for the clone of SEQ ID NO: 121.

SEQ ID NO: 123 is a longer determined cDNA sequence for C751P.

SEQ ID NO: 124 is a longer determined cDNA sequence for C791P.

SEQ ID NO: 125 is a longer determined cDNA sequence for C792P.

10 SEQ ID NO: 126 is a longer determined cDNA sequence for C793P.

SEQ ID NO: 127 is a longer determined cDNA sequence for C794P.

SEQ ID NO: 128 is a longer determined cDNA sequence for C795P.

SEQ ID NO: 129 is a longer determined cDNA sequence for C796P.

SEQ ID NO: 130 is a longer determined cDNA sequence for C797P.

15 SEQ ID NO: 131 is a longer determined cDNA sequence for C798P.

SEQ ID NO: 132 is a longer determined cDNA sequence for C799P.

SEQ ID NO: 133 is a first partial determined cDNA sequence for CoSub-3 (also known as 23569).

20 SEQ ID NO: 134 is a second partial determined cDNA sequence for CoSub-3 (also known as 23569).

SEQ ID NO: 135 is a first partial determined cDNA sequence for CoSub-13 (also known as 23579).

SEQ ID NO: 136 is a second partial determined cDNA sequence for CoSub-13 (also known as 23579).

25 SEQ ID NO: 137 is the determined cDNA sequence for CoSub-17 (also known as 23583).

SEQ ID NO: 138 is the determined cDNA sequence for CoSub-19 (also known as 23585).

30 SEQ ID NO: 139 is the determined cDNA sequence for CoSub-22 (also known as 23714).

SEQ ID NO: 140 is the determined cDNA sequence for CoSub-23 (also known as 23715).

SEQ ID NO: 141 is the determined cDNA sequence for CoSub-26 (also known as 23717).

5 SEQ ID NO: 142 is the determined cDNA sequence for CoSub-33 (also known as 23724).

SEQ ID NO: 143 is the determined cDNA sequence for CoSub-34 (also known as 23725).

10 SEQ ID NO: 144 is the determined cDNA sequence for CoSub-35 (also known as 23726).

SEQ ID NO: 145 is the determined cDNA sequence for CoSub-37 (also known as 23728).

SEQ ID NO: 146 is the determined cDNA sequence for CoSub-39 (also known as 23730).

15 SEQ ID NO: 147 is the determined cDNA sequence for CoSub-42 (also known as 23766).

SEQ ID NO: 148 is the determined cDNA sequence for CoSub-44 (also known as 23768).

20 SEQ ID NO: 149 is the determined cDNA sequence for CoSub-47 (also known as 23771).

SEQ ID NO: 150 is the determined cDNA sequence for CoSub-54 (also known as 23778).

SEQ ID NO: 151 is the determined cDNA sequence for CoSub-55 (also known as 23779).

25 SEQ ID NO: 152 is the determined cDNA sequence for CT1 (also known as 24099).

SEQ ID NO: 153 is the determined cDNA sequence for CT2 (also known as 24100).

SEQ ID NO: 154 is the determined cDNA sequence for CT3 (also known as 24101).

SEQ ID NO: 155 is the determined cDNA sequence for CT6 (also known as 24104).

SEQ ID NO: 156 is the determined cDNA sequence for CT7 (also known as 24105).

30 SEQ ID NO: 157 is the determined cDNA sequence for CT12 (also known as 24110).

SEQ ID NO: 158 is the determined cDNA sequence for CT13 (also known as 24111).

- SEQ ID NO: 159 is the determined cDNA sequence for CT14 (also known as 24112).
SEQ ID NO: 160 is the determined cDNA sequence for CT15 (also known as 24113).
SEQ ID NO: 161 is the determined cDNA sequence for CT17 (also known as 24115).
SEQ ID NO: 162 is the determined cDNA sequence for CT18 (also known as 24116).
5 SEQ ID NO: 163 is the determined cDNA sequence for CT22 (also known as 23848).
SEQ ID NO: 164 is the determined cDNA sequence for CT24 (also known as 23849).
SEQ ID NO: 165 is the determined cDNA sequence for CT31 (also known as 23854).
SEQ ID NO: 166 is the determined cDNA sequence for CT34 (also known as 23856).
SEQ ID NO: 167 is the determined cDNA sequence for CT37 (also known as 23859).
10 SEQ ID NO: 168 is the determined cDNA sequence for CT39 (also known as 23860).
SEQ ID NO: 169 is the determined cDNA sequence for CT40 (also known as 23861).
SEQ ID NO: 170 is the determined cDNA sequence for CT51 (also known as 24130).
SEQ ID NO: 171 is the determined cDNA sequence for CT53 (also known as 24132).
SEQ ID NO: 172 is the determined cDNA sequence for CT63 (also known as 24595).
15 SEQ ID NO: 173 is the determined cDNA sequence for CT88 (also known as 24608).
SEQ ID NO: 174 is the determined cDNA sequence for CT92 (also known as 24800).
SEQ ID NO: 175 is the determined cDNA sequence for CT94 (also known as 24802).
SEQ ID NO: 176 is the determined cDNA sequence for CT102 (also known as
24805).
20 SEQ ID NO: 177 is the determined cDNA sequence for CT103 (also known as
24806).
SEQ ID NO: 178 is the determined cDNA sequence for CT111 (also known as
25520).
SEQ ID NO: 179 is the determined cDNA sequence for CT118 (also known as
25 25522).
SEQ ID NO: 180 is the determined cDNA sequence for CT121 (also known as
25523).
SEQ ID NO: 181 is the determined cDNA sequence for CT126 (also known as
25527).
30 SEQ ID NO: 182 is the determined cDNA sequence for CT135 (also known as
25534).

SEQ ID NO: 183 is the determined cDNA sequence for CT140 (also known as 25537).

SEQ ID NO: 184 is the determined cDNA sequence for CT145 (also known as 25542).

5 SEQ ID NO: 185 is the determined cDNA sequence for CT147 (also known as 25543).

SEQ ID NO: 186 is the determined cDNA sequence for CT148 (also known as 25544).

10 SEQ ID NO: 187 is the determined cDNA sequence for CT502 (also known as 26420).

SEQ ID NO: 188 is the determined cDNA sequence for CT507 (also known as 26425).

SEQ ID NO: 189 is the determined cDNA sequence for CT521 (also known as 27366).

15 SEQ ID NO: 190 is the determined cDNA sequence for CT544 (also known as 27375).

SEQ ID NO: 191 is the determined cDNA sequence for CT577 (also known as 27385).

20 SEQ ID NO: 192 is the determined cDNA sequence for CT580 (also known as 27387).

SEQ ID NO: 193 is the determined cDNA sequence for CT594 (also known as 27540).

SEQ ID NO: 194 is the determined cDNA sequence for CT606 (also known as 27547).

25 SEQ ID NO: 195 is the determined cDNA sequence for CT607 (also known as 27548).

SEQ ID NO: 196 is the determined cDNA sequence for CT599 (also known as 27903).

30 SEQ ID NO: 197 is the determined cDNA sequence for CT632 (also known as 27922).

SEQ ID NO: 198 is the predicted amino acid sequence for CT502 (SEQ ID NO: 187).

SEQ ID NO: 199 is the predicted amino acid sequence for CT507 (SEQ ID NO: 188).
SEQ ID NO: 200 is the predicted amino acid sequence for CT521 (SEQ ID NO: 189).
SEQ ID NO: 201 is the predicted amino acid sequence for CT544 (SEQ ID NO: 190).
SEQ ID NO: 202 is the predicted amino acid sequence for CT606 (SEQ ID NO: 194).
5 SEQ ID NO: 203 is the predicted amino acid sequence for CT607 (SEQ ID NO: 195).
SEQ ID NO: 204 is the predicted amino acid sequence for CT632 (SEQ ID NO: 197).
SEQ ID NO: 205 is the determined cDNA sequence for clone 25244.
SEQ ID NO: 206 is the determined cDNA sequence for clone 25245.
SEQ ID NO: 207 is the determined cDNA sequence for clone 25246.
10 SEQ ID NO: 208 is the determined cDNA sequence for clone 25248.
SEQ ID NO: 209 is the determined cDNA sequence for clone 25249.
SEQ ID NO: 210 is the determined cDNA sequence for clone 25250.
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SEQ ID NO: 212 is the determined cDNA sequence for clone 25252.
15 SEQ ID NO: 213 is the determined cDNA sequence for clone 25253.
SEQ ID NO: 214 is the determined cDNA sequence for clone 25254.
SEQ ID NO: 215 is the determined cDNA sequence for clone 25255.
SEQ ID NO: 216 is the determined cDNA sequence for clone 25256.
SEQ ID NO: 217 is the determined cDNA sequence for clone 25257.
20 SEQ ID NO: 218 is the determined cDNA sequence for clone 25259.
SEQ ID NO: 219 is the determined cDNA sequence for clone 25260.
SEQ ID NO: 220 is the determined cDNA sequence for clone 25261.
SEQ ID NO: 221 is the determined cDNA sequence for clone 25262.
SEQ ID NO: 222 is the determined cDNA sequence for clone 25263.
25 SEQ ID NO: 223 is the determined cDNA sequence for clone 25264.
SEQ ID NO: 224 is the determined cDNA sequence for clone 25265.
SEQ ID NO: 225 is the determined cDNA sequence for clone 25266.
SEQ ID NO: 226 is the determined cDNA sequence for clone 25267.
SEQ ID NO: 227 is the determined cDNA sequence for clone 25268.
30 SEQ ID NO: 228 is the determined cDNA sequence for clone 25269.
SEQ ID NO: 229 is the determined cDNA sequence for clone 25271.

SEQ ID NO: 230 is the determined cDNA sequence for clone 25272.
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SEQ ID NO: 232 is the determined cDNA sequence for clone 25274.
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5 SEQ ID NO: 234 is the determined cDNA sequence for clone 25276.
SEQ ID NO: 235 is the determined cDNA sequence for clone 25277.
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10 SEQ ID NO: 239 is the determined cDNA sequence for clone 25282.
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20 SEQ ID NO: 249 is the determined cDNA sequence for clone 25292.
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SEQ ID NO: 253 is the determined cDNA sequence for clone 25296.
25 SEQ ID NO: 254 is the determined cDNA sequence for clone 25297.
SEQ ID NO: 255 is the determined cDNA sequence for clone 25418.
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SEQ ID NO: 261 is the determined cDNA sequence for clone 25424.
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10 SEQ ID NO: 270 is the determined cDNA sequence for clone 25434.
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30 SEQ ID NO: 290 is the determined cDNA sequence for clone 25850.
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SEQ ID NO: 302 is the determined cDNA sequence for clone 25862.
SEQ ID NO: 303 is the determined cDNA sequence for clone 25863.
SEQ ID NO: 304 is the determined cDNA sequence for clone 25864.
SEQ ID NO: 305 is the determined cDNA sequence for clone 25865.
15 SEQ ID NO: 306 is the determined cDNA sequence for clone 25866.
SEQ ID NO: 307 is the determined cDNA sequence for clone 25867.
SEQ ID NO: 308 is the determined cDNA sequence for clone 25868.
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20 SEQ ID NO: 311 is the determined cDNA sequence for clone 25871.
SEQ ID NO: 312 is the determined cDNA sequence for clone 25872.
SEQ ID NO: 313 is the determined cDNA sequence for clone 25873.
SEQ ID NO: 314 is the determined cDNA sequence for clone 25875.
SEQ ID NO: 315 is the determined cDNA sequence for clone 25876.
25 SEQ ID NO: 316 is the determined cDNA sequence for clone 25877.
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30 SEQ ID NO: 321 is the determined cDNA sequence for clone 25882.
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5 SEQ ID NO: 327 is the determined cDNA sequence for clone 25888.
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SEQ ID NO: 329 is the determined cDNA sequence for clone 25890.
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10 SEQ ID NO: 332 is the determined cDNA sequence for clone 25895.
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SEQ ID NO: 334 is the determined cDNA sequence for clone 25897.
SEQ ID NO: 335 is the determined cDNA sequence for clone 25899.
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15 SEQ ID NO: 337 is the determined cDNA sequence for clone 25901.
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20 SEQ ID NO: 342 is the determined cDNA sequence for clone 25907.
SEQ ID NO: 343 is the determined cDNA sequence for clone 25908.
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SEQ ID NO: 345 is the determined cDNA sequence for clone 25910.
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25 SEQ ID NO: 347 is the determined cDNA sequence for clone 25912.
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10 SEQ ID NO: 363 is the determined cDNA sequence for clone 25929.
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25 SEQ ID NO: 378 is the determined cDNA sequence for clone 31952.
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30 SEQ ID NO: 383 is the determined cDNA sequence for clone 31980.
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15 SEQ ID NO: 399 is the determined cDNA sequence for clone 32012.
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20 SEQ ID NO: 404 is the determined cDNA sequence for clone 32011.
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SEQ ID NO: 408 is the determined cDNA sequence for clone 31989.
25 SEQ ID NO: 409 is the determined cDNA sequence for clone 32015.
SEQ ID NO: 410 is the determined cDNA sequence for clone 32002.
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SEQ ID NO: 416 is the determined cDNA sequence for clone 31935.
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5 SEQ ID NO: 420 is the determined cDNA sequence for clone 31971.
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10 SEQ ID NO: 425 is the determined cDNA sequence for clone 32006.
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20 SEQ ID NO: 435 is the determined cDNA sequence for clone 32010.
SEQ ID NO: 436 is the determined cDNA sequence for clone 31974.
SEQ ID NO: 437 is the determined cDNA sequence for clone 31983.
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SEQ ID NO: 439 is the determined cDNA sequence for clone 31949.
25 SEQ ID NO: 440 is the determined cDNA sequence for clone 31947.
SEQ ID NO: 441 is the determined cDNA sequence for clone 31994.
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SEQ ID NO: 444 is the determined cDNA sequence for clone 31984.
30 SEQ ID NO: 445 is the determined cDNA sequence for clone 32024.
SEQ ID NO: 446 is the determined cDNA sequence for clone 31972.

SEQ ID NO: 447 is the determined cDNA sequence for clone 31943.
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SEQ ID NO: 450 is the determined cDNA sequence for clone 32009.
5 SEQ ID NO: 451 is the determined cDNA sequence for clone 32019.
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SEQ ID NO: 454 is the determined cDNA sequence for clone 31968.
SEQ ID NO: 455 is the determined cDNA sequence for clone 31955.
10 SEQ ID NO: 456 is the determined cDNA sequence for clone 31951.
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SEQ ID NO: 458 is the determined cDNA sequence for clone 31962.
SEQ ID NO: 459 is the determined cDNA sequence for clone 32001.
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15 SEQ ID NO: 461 is the determined cDNA sequence for clone 31944.
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SEQ ID NO: 463 is the determined cDNA sequence for clone 31828.
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SEQ ID NO: 465 is the determined cDNA sequence for clone 31841.
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SEQ ID NO: 467 is the determined cDNA sequence for clone 31850.
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SEQ ID NO: 469 is the determined cDNA sequence for clone 31855.
SEQ ID NO: 470 is the determined cDNA sequence for clone 31858.
25 SEQ ID NO: 471 is the determined cDNA sequence for clone 31861.
SEQ ID NO: 472 is the determined cDNA sequence for clone 31868.
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SEQ ID NO: 475 is the determined cDNA sequence for clone 31873.
30 SEQ ID NO: 476 is the determined cDNA sequence for clone 31877.
SEQ ID NO: 477 is the determined cDNA sequence for clone 31878.

SEQ ID NO: 478 is the determined cDNA sequence for clone 31885.

SEQ ID NO: 479 is the determined cDNA sequence for clone 31888.

SEQ ID NO: 480 is the determined cDNA sequence for clone 31890.

SEQ ID NO: 481 is the determined cDNA sequence for clone 31893.

5 SEQ ID NO: 482 is the determined cDNA sequence for clone 31898.

SEQ ID NO: 483 is the determined cDNA sequence for clone 31901.

SEQ ID NO: 484 is the determined cDNA sequence for clone 31909.

SEQ ID NO: 485 is the determined cDNA sequence for clone 31910.

SEQ ID NO: 486 is the determined cDNA sequence for clone 31914.

10

DETAILED DESCRIPTION OF THE INVENTION

As noted above, the present invention is generally directed to compositions and methods for the therapy and diagnosis of cancer, such as colon cancer. The compositions described herein may include colon tumor polypeptides, polynucleotides encoding such

15 polypeptides, binding agents such as antibodies, antigen presenting cells (APCs) and/or immune system cells (*e.g.*, T cells). Polypeptides of the present invention generally comprise at least a portion (such as an immunogenic portion) of a colon tumor protein or a variant thereof. A "colon tumor protein" is a protein that is expressed in colon tumor cells at a level that is at least two fold, and preferably at least five fold, greater than the level of expression in

20 a normal tissue, as determined using a representative assay provided herein. Certain colon tumor proteins are tumor proteins that react detectably (within an immunoassay, such as an ELISA or Western blot) with antisera of a patient afflicted with colon cancer. Polynucleotides of the subject invention generally comprise a DNA or RNA sequence that encodes all or a portion of such a polypeptide, or that is complementary to such a sequence.

25 Antibodies are generally immune system proteins, or antigen-binding fragments thereof, that are capable of binding to a polypeptide as described above. Antigen presenting cells include dendritic cells, macrophages, monocytes, fibroblasts and B-cells that express a polypeptide as described above. T cells that may be employed within such compositions are generally T cells that are specific for a polypeptide as described above.

The present invention is based on the discovery of human colon tumor proteins. Sequences of polynucleotides encoding specific tumor proteins are provided in SEQ ID NO: 1-121, 123-197 and 205-486.

5 COLON TUMOR PROTEIN POLYNUCLEOTIDES

Any polynucleotide that encodes a colon tumor protein or a portion or other variant thereof as described herein is encompassed by the present invention. Preferred polynucleotides comprise at least 15 consecutive nucleotides, preferably at least 30 consecutive nucleotides and more preferably at least 45 consecutive nucleotides, that encode
10 a portion of a colon tumor protein. More preferably, a polynucleotide encodes an immunogenic portion of a colon tumor protein. Polynucleotides complementary to any such sequences are also encompassed by the present invention. Polynucleotides may be single-stranded (coding or antisense) or double-stranded, and may be DNA (genomic, cDNA or synthetic) or RNA molecules. RNA molecules include HnRNA molecules, which contain
15 introns and correspond to a DNA molecule in a one-to-one manner, and mRNA molecules, which do not contain introns. Additional coding or non-coding sequences may, but need not, be present within a polynucleotide of the present invention, and a polynucleotide may, but need not, be linked to other molecules and/or support materials.

Polynucleotides may comprise a native sequence (*i.e.*, an endogenous
20 sequence that encodes a colon tumor protein or a portion thereof) or may comprise a variant of such a sequence. Polynucleotide variants may contain one or more substitutions, additions, deletions and/or insertions such that the immunogenicity of the encoded polypeptide is not diminished, relative to a native tumor protein. The effect on the immunogenicity of the encoded polypeptide may generally be assessed as described herein.
25 Variants preferably exhibit at least about 70% identity, more preferably at least about 80% identity and most preferably at least about 90% identity to a polynucleotide sequence that encodes a native colon tumor protein or a portion thereof.

Two polynucleotide or polypeptide sequences are said to be "identical" if the sequence of nucleotides or amino acids in the two sequences is the same when aligned for
30 maximum correspondence as described below. Comparisons between two sequences are typically performed by comparing the sequences over a comparison window to identify and

compare local regions of sequence similarity. A "comparison window" as used herein, refers to a segment of at least about 20 contiguous positions, usually 30 to about 75, in which a sequence may be compared to a reference sequence of the same number of contiguous positions after the two sequences are optimally aligned.

5 Optimal alignment of sequences for comparison may be conducted using the Megalign program in the Lasergene suite of bioinformatics software (DNASTAR, Inc., Madison, WI), using default parameters. This program embodies several alignment schemes described in the following references: Dayhoff, M.O. (1978) A model of evolutionary change in proteins – Matrices for detecting distant relationships. In Dayhoff, M.O. (ed.) Atlas of
10 Protein Sequence and Structure, National Biomedical Research Foundation, Washington DC Vol. 5, Suppl. 3, pp. 345-358; Hein J. (1990) Unified Approach to Alignment and Phylogenesis pp. 626-645 *Methods in Enzymology* vol. 183, Academic Press, Inc., San Diego, CA; Higgins, D.G. and Sharp, P.M. (1989) *CABIOS* 5:151-153; Myers, E.W. and Muller W. (1988) *CABIOS* 4:11-17; Robinson, E.D. (1971) *Comb. Theor* 11:105; Santou, N. Nes, M.
15 (1987) *Mol. Biol. Evol.* 4:406-425; Sneath, P.H.A. and Sokal, R.R. (1973) *Numerical Taxonomy – the Principles and Practice of Numerical Taxonomy*, Freeman Press, San Francisco, CA; Wilbur, W.J. and Lipman, D.J. (1983) *Proc. Natl. Acad. Sci. USA* 80:726-730.

 Preferably, the "percentage of sequence identity" is determined by comparing
20 two optimally aligned sequences over a window of comparison of at least 20 positions, wherein the portion of the polynucleotide or polypeptide sequence in the comparison window may comprise additions or deletions (i.e. gaps) of 20 percent or less, usually 5 to 15 percent, or 10 to 12 percent, as compared to the reference sequence (which does not comprise additions or deletions) for optimal alignment of the two sequences. The percentage is
25 calculated by determining the number of positions at which the identical nucleic acid bases or amino acid residue occurs in both sequences to yield the number of matched positions, dividing the number of matched positions by the total number of positions in the reference sequence (i.e. the window size) and multiplying the results by 100 to yield the percentage of sequence identity.

30 Variants may also, or alternatively, be substantially homologous to a native gene, or a portion or complement thereof. Such polynucleotide variants are capable of

hybridizing under moderately stringent conditions to a naturally occurring DNA sequence encoding a native colon tumor protein (or a complementary sequence). Suitable moderately stringent conditions include prewashing in a solution of 5 X SSC, 0.5% SDS, 1.0 mM EDTA (pH 8.0); hybridizing at 50°C-65°C, 5 X SSC, overnight; followed by washing twice at 65°C
5 for 20 minutes with each of 2X, 0.5X and 0.2X SSC containing 0.1% SDS.

It will be appreciated by those of ordinary skill in the art that, as a result of the degeneracy of the genetic code, there are many nucleotide sequences that encode a polypeptide as described herein. Some of these polynucleotides bear minimal homology to the nucleotide sequence of any native gene. Nonetheless, polynucleotides that vary due to
10 differences in codon usage are specifically contemplated by the present invention. Further, alleles of the genes comprising the polynucleotide sequences provided herein are within the scope of the present invention. Alleles are endogenous genes that are altered as a result of one or more mutations, such as deletions, additions and/or substitutions of nucleotides. The resulting mRNA and protein may, but need not, have an altered structure or function. Alleles
15 may be identified using standard techniques (such as hybridization, amplification and/or database sequence comparison).

Polynucleotides may be prepared using any of a variety of techniques. For example, a polynucleotide may be identified, as described in more detail below, by screening a microarray of cDNAs for tumor-associated expression (*i.e.*, expression that is at least two
20 fold greater in a colon tumor than in normal tissue, as determined using a representative assay provided herein). Such screens may be performed using a Synteni microarray (Palo Alto, CA) according to the manufacturer's instructions (and essentially as described by Schena et al., *Proc. Natl. Acad. Sci. USA* 93:10614-10619, 1996 and Heller et al., *Proc. Natl. Acad. Sci. USA* 94:2150-2155, 1997). Alternatively, polypeptides may be amplified from cDNA
25 prepared from cells expressing the proteins described herein, such as colon tumor cells. Such polynucleotides may be amplified via polymerase chain reaction (PCR). For this approach, sequence-specific primers may be designed based on the sequences provided herein, and may be purchased or synthesized.

An amplified portion may be used to isolate a full length gene from a suitable
30 library (*e.g.*, a colon tumor cDNA library) using well known techniques. Within such techniques, a library (cDNA or genomic) is screened using one or more polynucleotide

probes or primers suitable for amplification. Preferably, a library is size-selected to include larger molecules. Random primed libraries may also be preferred for identifying 5' and upstream regions of genes. Genomic libraries are preferred for obtaining introns and extending 5' sequences.

5 For hybridization techniques, a partial sequence may be labeled (e.g., by nick-translation or end-labeling with ^{32}P) using well known techniques. A bacterial or bacteriophage library is then screened by hybridizing filters containing denatured bacterial colonies (or lawns containing phage plaques) with the labeled probe (see Sambrook et al., *Molecular Cloning: A Laboratory Manual*, Cold Spring Harbor Laboratories, Cold Spring
10 Harbor, NY, 1989). Hybridizing colonies or plaques are selected and expanded, and the DNA is isolated for further analysis. cDNA clones may be analyzed to determine the amount of additional sequence by, for example, PCR using a primer from the partial sequence and a primer from the vector. Restriction maps and partial sequences may be generated to identify one or more overlapping clones. The complete sequence may then be determined using
15 standard techniques, which may involve generating a series of deletion clones. The resulting overlapping sequences are then assembled into a single contiguous sequence. A full length cDNA molecule can be generated by ligating suitable fragments, using well known techniques.

Alternatively, there are numerous amplification techniques for obtaining a full
20 length coding sequence from a partial cDNA sequence. Within such techniques, amplification is generally performed via PCR. Any of a variety of commercially available kits may be used to perform the amplification step. Primers may be designed using, for example, software well known in the art. Primers are preferably 22-30 nucleotides in length, have a GC content of at least 50% and anneal to the target sequence at temperatures of about
25 68°C to 72°C. The amplified region may be sequenced as described above, and overlapping sequences assembled into a contiguous sequence.

One such amplification technique is inverse PCR (see Triglia et al., *Nucl. Acids Res.* 16:8186, 1988), which uses restriction enzymes to generate a fragment in the known region of the gene. The fragment is then circularized by intramolecular ligation and
30 used as a template for PCR with divergent primers derived from the known region. Within an alternative approach, sequences adjacent to a partial sequence may be retrieved by

amplification with a primer to a linker sequence and a primer specific to a known region. The amplified sequences are typically subjected to a second round of amplification with the same linker primer and a second primer specific to the known region. A variation on this procedure, which employs two primers that initiate extension in opposite directions from the known sequence, is described in WO 96/38591. Another such technique is known as "rapid amplification of cDNA ends" or RACE. This technique involves the use of an internal primer and an external primer, which hybridizes to a polyA region or vector sequence, to identify sequences that are 5' and 3' of a known sequence. Additional techniques include capture PCR (Lagerstrom et al., *PCR Methods Applic.* 1:111-19, 1991) and walking PCR (Parker et al., *Nucl. Acids Res.* 19:3055-60, 1991). Other methods employing amplification may also be employed to obtain a full length cDNA sequence.

In certain instances, it is possible to obtain a full length cDNA sequence by analysis of sequences provided in an expressed sequence tag (EST) database, such as that available from GenBank. Searches for overlapping ESTs may generally be performed using well known programs (e.g., NCBI BLAST searches), and such ESTs may be used to generate a contiguous full length sequence.

Certain nucleic acid sequences of cDNA molecules encoding portions of colon tumor proteins are provided in SEQ ID NO: 1-121, 123-197 and 205-486. These polynucleotides were isolated from colon tumor cDNA libraries using conventional and/or PCR-based subtraction techniques, as described below.

Polynucleotide variants may generally be prepared by any method known in the art, including chemical synthesis by, for example, solid phase phosphoramidite chemical synthesis. Modifications in a polynucleotide sequence may also be introduced using standard mutagenesis techniques, such as oligonucleotide-directed site-specific mutagenesis (see Adelman et al., *DNA* 2:183, 1983). Alternatively, RNA molecules may be generated by *in vitro* or *in vivo* transcription of DNA sequences encoding a colon tumor protein, or portion thereof, provided that the DNA is incorporated into a vector with a suitable RNA polymerase promoter (such as T7 or SP6). Certain portions may be used to prepare an encoded polypeptide, as described herein. In addition, or alternatively, a portion may be administered to a patient such that the encoded polypeptide is generated *in vivo* (e.g., by transfecting

antigen-presenting cells, such as dendritic cells, with a cDNA construct encoding a colon tumor polypeptide, and administering the transfected cells to the patient).

A portion of a sequence complementary to a coding sequence (*i.e.*, an antisense polynucleotide) may also be used as a probe or to modulate gene expression. cDNA constructs that can be transcribed into antisense RNA may also be introduced into cells of tissues to facilitate the production of antisense RNA. An antisense polynucleotide may be used, as described herein, to inhibit expression of a tumor protein. Antisense technology can be used to control gene expression through triple-helix formation, which compromises the ability of the double helix to open sufficiently for the binding of polymerases, transcription factors or regulatory molecules (*see* Gee et al., *In Huber and Carr, Molecular and Immunologic Approaches*, Futura Publishing Co. (Mt. Kisco, NY; 1994)). Alternatively, an antisense molecule may be designed to hybridize with a control region of a gene (*e.g.*, promoter, enhancer or transcription initiation site), and block transcription of the gene; or to block translation by inhibiting binding of a transcript to ribosomes.

A portion of a coding sequence, or of a complementary sequence, may also be designed as a probe or primer to detect gene expression. Probes may be labeled with a variety of reporter groups, such as radionuclides and enzymes, and are preferably at least 10 nucleotides in length, more preferably at least 20 nucleotides in length and still more preferably at least 30 nucleotides in length. Primers, as noted above, are preferably 22-30 nucleotides in length.

Any polynucleotide may be further modified to increase stability *in vivo*. Possible modifications include, but are not limited to, the addition of flanking sequences at the 5' and/or 3' ends; the use of phosphorothioate or 2' O-methyl rather than phosphodiesterase linkages in the backbone; and/or the inclusion of nontraditional bases such as inosine, queosine and wybutosine, as well as acetyl-, methyl-, thio- and other modified forms of adenine, cytidine, guanine, thymine and uridine.

Nucleotide sequences as described herein may be joined to a variety of other nucleotide sequences using established recombinant DNA techniques. For example, a polynucleotide may be cloned into any of a variety of cloning vectors, including plasmids, phagemids, lambda phage derivatives and cosmids. Vectors of particular interest include expression vectors, replication vectors, probe generation vectors and sequencing vectors. In

general, a vector will contain an origin of replication functional in at least one organism, convenient restriction endonuclease sites and one or more selectable markers. Other elements will depend upon the desired use, and will be apparent to those of ordinary skill in the art.

Within certain embodiments, polynucleotides may be formulated so as to permit entry into a cell of a mammal, and expression therein. Such formulations are particularly useful for therapeutic purposes, as described below. Those of ordinary skill in the art will appreciate that there are many ways to achieve expression of a polynucleotide in a target cell, and any suitable method may be employed. For example, a polynucleotide may be incorporated into a viral vector such as, but not limited to, adenovirus, adeno-associated virus, retrovirus, or vaccinia or other pox virus (*e.g.*, avian pox virus). Techniques for incorporating DNA into such vectors are well known to those of ordinary skill in the art. A retroviral vector may additionally transfer or incorporate a gene for a selectable marker (to aid in the identification or selection of transduced cells) and/or a targeting moiety, such as a gene that encodes a ligand for a receptor on a specific target cell, to render the vector target specific. Targeting may also be accomplished using an antibody, by methods known to those of ordinary skill in the art.

Other formulations for therapeutic purposes include colloidal dispersion systems, such as macromolecule complexes, nanocapsules, microspheres, beads, and lipid-based systems including oil-in-water emulsions, micelles, mixed micelles, and liposomes. A preferred colloidal system for use as a delivery vehicle *in vitro* and *in vivo* is a liposome (*i.e.*, an artificial membrane vesicle). The preparation and use of such systems is well known in the art.

COLON TUMOR POLYPEPTIDES

Within the context of the present invention, polypeptides may comprise at least an immunogenic portion of a colon tumor protein or a variant thereof, as described herein. As noted above, a "colon tumor protein" is a protein that is expressed by colon tumor cells. Proteins that are colon tumor proteins also react detectably within an immunoassay (such as an ELISA) with antisera from a patient with colon cancer. Polypeptides as described herein may be of any length. Additional sequences derived from the native protein and/or

heterologous sequences may be present, and such sequences may (but need not) possess further immunogenic or antigenic properties.

An "immunogenic portion," as used herein is a portion of a protein that is recognized (*i.e.*, specifically bound) by a B-cell and/or T-cell surface antigen receptor. Such immunogenic portions generally comprise at least 5 amino acid residues, more preferably at least 10, and still more preferably at least 20 amino acid residues of a colon tumor protein or a variant thereof. Certain preferred immunogenic portions include peptides in which an N-terminal leader sequence and/or transmembrane domain have been deleted. Other preferred immunogenic portions may contain a small N- and/or C-terminal deletion (*e.g.*, 1-30 amino acids, preferably 5-15 amino acids), relative to the mature protein.

Immunogenic portions may generally be identified using well known techniques, such as those summarized in Paul, *Fundamental Immunology*, 3rd ed., 243-247 (Raven Press, 1993) and references cited therein. Such techniques include screening polypeptides for the ability to react with antigen-specific antibodies, antisera and/or T-cell lines or clones. As used herein, antisera and antibodies are "antigen-specific" if they specifically bind to an antigen (*i.e.*, they react with the protein in an ELISA or other immunoassay, and do not react detectably with unrelated proteins). Such antisera and antibodies may be prepared as described herein, and using well known techniques. An immunogenic portion of a native colon tumor protein is a portion that reacts with such antisera and/or T-cells at a level that is not substantially less than the reactivity of the full length polypeptide (*e.g.*, in an ELISA and/or T-cell reactivity assay). Such immunogenic portions may react within such assays at a level that is similar to or greater than the reactivity of the full length polypeptide. Such screens may generally be performed using methods well known to those of ordinary skill in the art, such as those described in Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. For example, a polypeptide may be immobilized on a solid support and contacted with patient sera to allow binding of antibodies within the sera to the immobilized polypeptide. Unbound sera may then be removed and bound antibodies detected using, for example, ¹²⁵I-labeled Protein A.

As noted above, a composition may comprise a variant of a native colon tumor protein. A polypeptide "variant," as used herein, is a polypeptide that differs from a native colon tumor protein in one or more substitutions, deletions, additions and/or insertions, such

that the immunogenicity of the polypeptide is not substantially diminished. In other words, the ability of a variant to react with antigen-specific antisera may be enhanced or unchanged, relative to the native protein, or may be diminished by less than 50%, and preferably less than 20%, relative to the native protein. Such variants may generally be identified by modifying one of the above polypeptide sequences and evaluating the reactivity of the modified polypeptide with antigen-specific antibodies or antisera as described herein. Preferred variants include those in which one or more portions, such as an N-terminal leader sequence or transmembrane domain, have been removed. Other preferred variants include variants in which a small portion (e.g., 1-30 amino acids, preferably 5-15 amino acids) has been removed from the N- and/or C-terminal of the mature protein.

Polypeptide variants preferably exhibit at least about 70%, more preferably at least about 90% and most preferably at least about 95% identity (determined as described above) to the identified polypeptides.

Preferably, a variant contains conservative substitutions. A "conservative substitution" is one in which an amino acid is substituted for another amino acid that has similar properties, such that one skilled in the art of peptide chemistry would expect the secondary structure and hydropathic nature of the polypeptide to be substantially unchanged. Amino acid substitutions may generally be made on the basis of similarity in polarity, charge, solubility, hydrophobicity, hydrophilicity and/or the amphipathic nature of the residues. For example, negatively charged amino acids include aspartic acid and glutamic acid; positively charged amino acids include lysine and arginine; and amino acids with uncharged polar head groups having similar hydrophilicity values include leucine, isoleucine and valine; glycine and alanine; asparagine and glutamine; and serine, threonine, phenylalanine and tyrosine. Other groups of amino acids that may represent conservative changes include: (1) ala, pro, gly, glu, asp, gln, asn, ser, thr; (2) cys, ser, tyr, thr; (3) val, ile, leu, met, ala, phe; (4) lys, arg, his; and (5) phe, tyr, trp, his. A variant may also, or alternatively, contain non-conservative changes. In a preferred embodiment, variant polypeptides differ from a native sequence by substitution, deletion or addition of five amino acids or fewer. Variants may also (or alternatively) be modified by, for example, the deletion or addition of amino acids that have minimal influence on the immunogenicity, secondary structure and hydropathic nature of the polypeptide.

As noted above, polypeptides may comprise a signal (or leader) sequence at the N-terminal end of the protein which co-translationally or post-translationally directs transfer of the protein. The polypeptide may also be conjugated to a linker or other sequence for ease of synthesis, purification or identification of the polypeptide (e.g., poly-His), or to enhance binding of the polypeptide to a solid support. For example, a polypeptide may be conjugated to an immunoglobulin Fc region.

Polypeptides may be prepared using any of a variety of well known techniques. Recombinant polypeptides encoded by DNA sequences as described above may be readily prepared from the DNA sequences using any of a variety of expression vectors known to those of ordinary skill in the art. Expression may be achieved in any appropriate host cell that has been transformed or transfected with an expression vector containing a DNA molecule that encodes a recombinant polypeptide. Suitable host cells include prokaryotes, yeast and higher eukaryotic cells. Preferably, the host cells employed are *E. coli*, yeast or a mammalian cell line such as COS or CHO. Supernatants from suitable host/vector systems which secrete recombinant protein or polypeptide into culture media may be first concentrated using a commercially available filter. Following concentration, the concentrate may be applied to a suitable purification matrix such as an affinity matrix or an ion exchange resin. Finally, one or more reverse phase HPLC steps can be employed to further purify a recombinant polypeptide.

Portions and other variants having fewer than about 100 amino acids, and generally fewer than about 50 amino acids, may also be generated by synthetic means, using techniques well known to those of ordinary skill in the art. For example, such polypeptides may be synthesized using any of the commercially available solid-phase techniques, such as the Merrifield solid-phase synthesis method, where amino acids are sequentially added to a growing amino acid chain. See Merrifield, *J. Am. Chem. Soc.* 85:2149-2146, 1963. Equipment for automated synthesis of polypeptides is commercially available from suppliers such as Perkin Elmer/Applied BioSystems Division (Foster City, CA), and may be operated according to the manufacturer's instructions.

Within certain specific embodiments, a polypeptide may be a fusion protein that comprises multiple polypeptides as described herein, or that comprises at least one polypeptide as described herein and an unrelated sequence, such as a known tumor protein. A

fusion partner may, for example, assist in providing T helper epitopes (an immunological fusion partner), preferably T helper epitopes recognized by humans, or may assist in expressing the protein (an expression enhancer) at higher yields than the native recombinant protein. Certain preferred fusion partners are both immunological and expression enhancing
5 fusion partners. Other fusion partners may be selected so as to increase the solubility of the protein or to enable the protein to be targeted to desired intracellular compartments. Still further fusion partners include affinity tags, which facilitate purification of the protein.

Fusion proteins may generally be prepared using standard techniques, including chemical conjugation. Preferably, a fusion protein is expressed as a recombinant
10 protein, allowing the production of increased levels, relative to a non-fused protein, in an expression system. Briefly, DNA sequences encoding the polypeptide components may be assembled separately, and ligated into an appropriate expression vector. The 3' end of the DNA sequence encoding one polypeptide component is ligated, with or without a peptide linker, to the 5' end of a DNA sequence encoding the second polypeptide component so that
15 the reading frames of the sequences are in phase. This permits translation into a single fusion protein that retains the biological activity of both component polypeptides.

A peptide linker sequence may be employed to separate the first and the second polypeptide components by a distance sufficient to ensure that each polypeptide folds into its secondary and tertiary structures. Such a peptide linker sequence is incorporated into
20 the fusion protein using standard techniques well known in the art. Suitable peptide linker sequences may be chosen based on the following factors: (1) their ability to adopt a flexible extended conformation; (2) their inability to adopt a secondary structure that could interact with functional epitopes on the first and second polypeptides; and (3) the lack of hydrophobic or charged residues that might react with the polypeptide functional epitopes. Preferred
25 peptide linker sequences contain Gly, Asn and Ser residues. Other near neutral amino acids, such as Thr and Ala may also be used in the linker sequence. Amino acid sequences which may be usefully employed as linkers include those disclosed in Maratea et al., *Gene* 40:39-46, 1985; Murphy et al., *Proc. Natl. Acad. Sci. USA* 83:8258-8262, 1986; U.S. Patent No. 4,935,233 and U.S. Patent No. 4,751,180. The linker sequence may generally be from 1
30 to about 50 amino acids in length. Linker sequences are not required when the first and

second polypeptides have non-essential N-terminal amino acid regions that can be used to separate the functional domains and prevent steric interference.

The ligated DNA sequences are operably linked to suitable transcriptional or translational regulatory elements. The regulatory elements responsible for expression of DNA are located only 5' to the DNA sequence encoding the first polypeptides. Similarly, stop codons required to end translation and transcription termination signals are only present 3' to the DNA sequence encoding the second polypeptide.

Fusion proteins are also provided that comprise a polypeptide of the present invention together with an unrelated immunogenic protein. Preferably the immunogenic protein is capable of eliciting a recall response. Examples of such proteins include tetanus, tuberculosis and hepatitis proteins (*see*, for example, Stoute et al. *New Engl. J. Med.*, 336:86-91, 1997).

Within preferred embodiments, an immunological fusion partner is derived from protein D, a surface protein of the gram-negative bacterium *Haemophilus influenza B* (WO 91/18926). Preferably, a protein D derivative comprises approximately the first third of the protein (*e.g.*, the first N-terminal 100-110 amino acids), and a protein D derivative may be lipidated. Within certain preferred embodiments, the first 109 residues of a Lipoprotein D fusion partner is included on the N-terminus to provide the polypeptide with additional exogenous T-cell epitopes and to increase the expression level in *E. coli* (thus functioning as an expression enhancer). The lipid tail ensures optimal presentation of the antigen to antigen presenting cells. Other fusion partners include the non-structural protein from influenzae virus, NS1 (hemagglutinin). Typically, the N-terminal 81 amino acids are used, although different fragments that include T-helper epitopes may be used.

In another embodiment, the immunological fusion partner is the protein known as LYTA, or a portion thereof (preferably a C-terminal portion). LYTA is derived from *Streptococcus pneumoniae*, which synthesizes an N-acetyl-L-alanine amidase known as amidase LYTA (encoded by the *LytA* gene; *Gene* 43:265-292, 1986). LYTA is an autolysin that specifically degrades certain bonds in the peptidoglycan backbone. The C-terminal domain of the LYTA protein is responsible for the affinity to the choline or to some choline analogues such as DEAE. This property has been exploited for the development of *E. coli* C-LYTA expressing plasmids useful for expression of fusion proteins. Purification of hybrid

proteins containing the C-LYTA fragment at the amino terminus has been described (*see Biotechnology 10:795-798, 1992*). Within a preferred embodiment, a repeat portion of LYTA may be incorporated into a fusion protein. A repeat portion is found in the C-terminal region starting at residue 178. A particularly preferred repeat portion incorporates residues 188-305.

5 In general, polypeptides (including fusion proteins) and polynucleotides as described herein are isolated. An "isolated" polypeptide or polynucleotide is one that is removed from its original environment. For example, a naturally-occurring protein is isolated if it is separated from some or all of the coexisting materials in the natural system. Preferably, such polypeptides are at least about 90% pure, more preferably at least about 95%
10 pure and most preferably at least about 99% pure. A polynucleotide is considered to be isolated if, for example, it is cloned into a vector that is not a part of the natural environment.

BINDING AGENTS

The present invention further provides agents, such as antibodies and antigen-
15 binding fragments thereof, that specifically bind to a colon tumor protein. As used herein, an antibody, or antigen-binding fragment thereof, is said to "specifically bind" to a colon tumor protein if it reacts at a detectable level (within, for example, an ELISA) with a colon tumor protein, and does not react detectably with unrelated proteins under similar conditions. As used herein, "binding" refers to a noncovalent association between two separate molecules
20 such that a complex is formed. The ability to bind may be evaluated by, for example, determining a binding constant for the formation of the complex. The binding constant is the value obtained when the concentration of the complex is divided by the product of the component concentrations. In general, two compounds are said to "bind," in the context of the present invention, when the binding constant for complex formation exceeds about 10^3
25 L/mol. The binding constant may be determined using methods well known in the art.

Binding agents may be further capable of differentiating between patients with and without a cancer, such as colon cancer, using the representative assays provided herein. In other words, antibodies or other binding agents that bind to a colon tumor protein will generate a signal indicating the presence of a cancer in at least about 20% of patients with the
30 disease, and will generate a negative signal indicating the absence of the disease in at least about 90% of individuals without the cancer. To determine whether a binding agent satisfies

this requirement, biological samples (e.g., blood, sera, sputum, urine and/or tumor biopsies) from patients with and without a cancer (as determined using standard clinical tests) may be assayed as described herein for the presence of polypeptides that bind to the binding agent. It will be apparent that a statistically significant number of samples with and without the disease should be assayed. Each binding agent should satisfy the above criteria; however, those of ordinary skill in the art will recognize that binding agents may be used in combination to improve sensitivity.

Any agent that satisfies the above requirements may be a binding agent. For example, a binding agent may be a ribosome, with or without a peptide component, an RNA molecule or a polypeptide. In a preferred embodiment, a binding agent is an antibody or an antigen-binding fragment thereof. Antibodies may be prepared by any of a variety of techniques known to those of ordinary skill in the art. See, e.g., Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. In general, antibodies can be produced by cell culture techniques, including the generation of monoclonal antibodies as described herein, or via transfection of antibody genes into suitable bacterial or mammalian cell hosts, in order to allow for the production of recombinant antibodies. In one technique, an immunogen comprising the polypeptide is initially injected into any of a wide variety of mammals (e.g., mice, rats, rabbits, sheep or goats). In this step, the polypeptides of this invention may serve as the immunogen without modification. Alternatively, particularly for relatively short polypeptides, a superior immune response may be elicited if the polypeptide is joined to a carrier protein, such as bovine serum albumin or keyhole limpet hemocyanin. The immunogen is injected into the animal host, preferably according to a predetermined schedule incorporating one or more booster immunizations, and the animals are bled periodically. Polyclonal antibodies specific for the polypeptide may then be purified from such antisera by, for example, affinity chromatography using the polypeptide coupled to a suitable solid support.

Monoclonal antibodies specific for an antigenic polypeptide of interest may be prepared, for example, using the technique of Kohler and Milstein, *Eur. J. Immunol.* 6:511-519, 1976, and improvements thereto. Briefly, these methods involve the preparation of immortal cell lines capable of producing antibodies having the desired specificity (i.e., reactivity with the polypeptide of interest). Such cell lines may be produced, for example,

from spleen cells obtained from an animal immunized as described above. The spleen cells are then immortalized by, for example, fusion with a myeloma cell fusion partner, preferably one that is syngeneic with the immunized animal. A variety of fusion techniques may be employed. For example, the spleen cells and myeloma cells may be combined with a nonionic detergent for a few minutes and then plated at low density on a selective medium that supports the growth of hybrid cells, but not myeloma cells. A preferred selection technique uses HAT (hypoxanthine, aminopterin, thymidine) selection. After a sufficient time, usually about 1 to 2 weeks, colonies of hybrids are observed. Single colonies are selected and their culture supernatants tested for binding activity against the polypeptide.

10 Hybridomas having high reactivity and specificity are preferred.

Monoclonal antibodies may be isolated from the supernatants of growing hybridoma colonies. In addition, various techniques may be employed to enhance the yield, such as injection of the hybridoma cell line into the peritoneal cavity of a suitable vertebrate host, such as a mouse. Monoclonal antibodies may then be harvested from the ascites fluid or the blood. Contaminants may be removed from the antibodies by conventional techniques, such as chromatography, gel filtration, precipitation, and extraction. The polypeptides of this invention may be used in the purification process in, for example, an affinity chromatography step.

15

Within certain embodiments, the use of antigen-binding fragments of antibodies may be preferred. Such fragments include Fab fragments, which may be prepared using standard techniques. Briefly, immunoglobulins may be purified from rabbit serum by affinity chromatography on Protein A bead columns (Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988) and digested by papain to yield Fab and Fc fragments. The Fab and Fc fragments may be separated by affinity chromatography on protein A bead columns.

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Monoclonal antibodies of the present invention may be coupled to one or more therapeutic agents. Suitable agents in this regard include radionuclides, differentiation inducers, drugs, toxins, and derivatives thereof. Preferred radionuclides include ^{90}Y , ^{123}I , ^{125}I , ^{131}I , ^{186}Re , ^{188}Re , ^{211}At , and ^{212}Bi . Preferred drugs include methotrexate, and pyrimidine and purine analogs. Preferred differentiation inducers include phorbol esters and butyric acid.

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Preferred toxins include ricin, abrin, diphtheria toxin, cholera toxin, gelonin, *Pseudomonas* exotoxin, *Shigella* toxin, and pokeweed antiviral protein.

A therapeutic agent may be coupled (*e.g.*, covalently bonded) to a suitable monoclonal antibody either directly or indirectly (*e.g.*, via a linker group). A direct reaction
5 between an agent and an antibody is possible when each possesses a substituent capable of reacting with the other. For example, a nucleophilic group, such as an amino or sulfhydryl group, on one may be capable of reacting with a carbonyl-containing group, such as an anhydride or an acid halide, or with an alkyl group containing a good leaving group (*e.g.*, a halide) on the other.

10 Alternatively, it may be desirable to couple a therapeutic agent and an antibody via a linker group. A linker group can function as a spacer to distance an antibody from an agent in order to avoid interference with binding capabilities. A linker group can also serve to increase the chemical reactivity of a substituent on an agent or an antibody, and thus increase the coupling efficiency. An increase in chemical reactivity may also facilitate
15 the use of agents, or functional groups on agents, which otherwise would not be possible.

It will be evident to those skilled in the art that a variety of bifunctional or polyfunctional reagents, both homo- and hetero-functional (such as those described in the catalog of the Pierce Chemical Co., Rockford, IL), may be employed as the linker group. Coupling may be effected, for example, through amino groups, carboxyl groups, sulfhydryl
20 groups or oxidized carbohydrate residues. There are numerous references describing such methodology, *e.g.*, U.S. Patent No. 4,671,958, to Rodwell et al.

Where a therapeutic agent is more potent when free from the antibody portion of the immunoconjugates of the present invention, it may be desirable to use a linker group which is cleavable during or upon internalization into a cell. A number of different cleavable
25 linker groups have been described. The mechanisms for the intracellular release of an agent from these linker groups include cleavage by reduction of a disulfide bond (*e.g.*, U.S. Patent No. 4,489,710, to Spitler), by irradiation of a photolabile bond (*e.g.*, U.S. Patent No. 4,625,014, to Senter et al.), by hydrolysis of derivatized amino acid side chains (*e.g.*, U.S. Patent No. 4,638,045, to Kohn et al.), by serum complement-mediated hydrolysis (*e.g.*, U.S.
30 Patent No. 4,671,958, to Rodwell et al.), and acid-catalyzed hydrolysis (*e.g.*, U.S. Patent No. 4,569,789, to Blattler et al.).

It may be desirable to couple more than one agent to an antibody. In one embodiment, multiple molecules of an agent are coupled to one antibody molecule. In another embodiment, more than one type of agent may be coupled to one antibody. Regardless of the particular embodiment, immunoconjugates with more than one agent may be prepared in a variety of ways. For example, more than one agent may be coupled directly to an antibody molecule, or linkers which provide multiple sites for attachment can be used. Alternatively, a carrier can be used.

A carrier may bear the agents in a variety of ways, including covalent bonding either directly or via a linker group. Suitable carriers include proteins such as albumins (*e.g.*, U.S. Patent No. 4,507,234, to Kato et al.), peptides and polysaccharides such as aminodextran (*e.g.*, U.S. Patent No. 4,699,784, to Shih et al.). A carrier may also bear an agent by noncovalent bonding or by encapsulation, such as within a liposome vesicle (*e.g.*, U.S. Patent Nos. 4,429,008 and 4,873,088). Carriers specific for radionuclide agents include radiohalogenated small molecules and chelating compounds. For example, U.S. Patent No. 4,735,792 discloses representative radiohalogenated small molecules and their synthesis. A radionuclide chelate may be formed from chelating compounds that include those containing nitrogen and sulfur atoms as the donor atoms for binding the metal, or metal oxide, radionuclide. For example, U.S. Patent No. 4,673,562, to Davison et al. discloses representative chelating compounds and their synthesis.

A variety of routes of administration for the antibodies and immunoconjugates may be used. Typically, administration will be intravenous, intramuscular, subcutaneous or in the bed of a resected tumor. It will be evident that the precise dose of the antibody/immunoconjugate will vary depending upon the antibody used, the antigen density on the tumor, and the rate of clearance of the antibody.

T CELLS

Immunotherapeutic compositions may also, or alternatively, comprise T cells specific for a colon tumor protein. Such cells may generally be prepared *in vitro* or *ex vivo*, using standard procedures. For example, T cells may be isolated from bone marrow, peripheral blood, or a fraction of bone marrow or peripheral blood of a patient, using a commercially available cell separation system, such as the ISOLEX™ system, available from

Nexell Therapeutics Inc., Irvine, CA . Alternatively, T cells may be derived from related or unrelated humans, non-human mammals, cell lines or cultures.

5 T cells may be stimulated with a colon tumor polypeptide, polynucleotide encoding a colon tumor polypeptide and/or an antigen presenting cell (APC) that expresses such a polypeptide. Such stimulation is performed under conditions and for a time sufficient to permit the generation of T cells that are specific for the polypeptide. Preferably, a colon tumor polypeptide or polynucleotide is present within a delivery vehicle, such as a microsphere, to facilitate the generation of specific T cells.

10 T cells are considered to be specific for a colon tumor polypeptide if the T cells kill target cells coated with the polypeptide or expressing a gene encoding the polypeptide. T cell specificity may be evaluated using any of a variety of standard techniques. For example, within a chromium release assay or proliferation assay, a stimulation index of more than two fold increase in lysis and/or proliferation, compared to negative controls, indicates T cell specificity. Such assays may be performed, for example, as
15 described in Chen et al., *Cancer Res.* 54:1065-1070, 1994. Alternatively, detection of the proliferation of T cells may be accomplished by a variety of known techniques. For example, T cell proliferation can be detected by measuring an increased rate of DNA synthesis (*e.g.*, by pulse-labeling cultures of T cells with tritiated thymidine and measuring the amount of tritiated thymidine incorporated into DNA). Contact with a colon tumor polypeptide (100
20 ng/ml - 100 µg/ml, preferably 200 ng/ml - 25 µg/ml) for 3 - 7 days should result in at least a two fold increase in proliferation of the T cells. Contact as described above for 2-3 hours should result in activation of the T cells, as measured using standard cytokine assays in which a two fold increase in the level of cytokine release (*e.g.*, TNF or IFN-γ) is indicative of T cell activation (*see* Coligan et al., *Current Protocols in Immunology*, vol. 1, Wiley Interscience
25 (Greene 1998)). T cells that have been activated in response to a colon tumor polypeptide, polynucleotide or polypeptide-expressing APC may be CD4⁺ and/or CD8⁺. Colon tumor protein-specific T cells may be expanded using standard techniques. Within preferred embodiments, the T cells are derived from either a patient or a related, or unrelated, donor and are administered to the patient following stimulation and expansion.

30 For therapeutic purposes, CD4⁺ or CD8⁺ T cells that proliferate in response to a colon tumor polypeptide, polynucleotide or APC can be expanded in number either *in vitro*

or *in vivo*. Proliferation of such T cells *in vitro* may be accomplished in a variety of ways. For example, the T cells can be re-exposed to a colon tumor polypeptide, or a short peptide corresponding to an immunogenic portion of such a polypeptide, with or without the addition of T cell growth factors, such as interleukin-2, and/or stimulator cells that synthesize a colon tumor polypeptide. Alternatively, one or more T cells that proliferate in the presence of a colon tumor protein can be expanded in number by cloning. Methods for cloning cells are well known in the art, and include limiting dilution.

PHARMACEUTICAL COMPOSITIONS AND VACCINES

Within certain aspects, polypeptides, polynucleotides, T cells and/or binding agents disclosed herein may be incorporated into pharmaceutical compositions or immunogenic compositions (*i.e.*, vaccines). Pharmaceutical compositions comprise one or more such compounds and a physiologically acceptable carrier. Vaccines may comprise one or more such compounds and an immunostimulant. An immunostimulant may be any substance that enhances or potentiates an immune response to an exogenous antigen. Examples of immunostimulants include adjuvants, biodegradable microspheres (*e.g.*, polylactic galactide) and liposomes (into which the compound is incorporated; *see e.g.*, Fullerton, U.S. Patent No. 4,235,877). Vaccine preparation is generally described in, for example, M.F. Powell and M.J. Newman, eds., "Vaccine Design (the subunit and adjuvant approach)," Plenum Press (NY, 1995). Pharmaceutical compositions and vaccines within the scope of the present invention may also contain other compounds, which may be biologically active or inactive. For example, one or more immunogenic portions of other tumor antigens may be present, either incorporated into a fusion polypeptide or as a separate compound, within the composition or vaccine.

A pharmaceutical composition or vaccine may contain DNA encoding one or more of the polypeptides as described above, such that the polypeptide is generated *in situ*. As noted above, the DNA may be present within any of a variety of delivery systems known to those of ordinary skill in the art, including nucleic acid expression systems, bacteria and viral expression systems. Numerous gene delivery techniques are well known in the art, such as those described by Rolland, *Crit. Rev. Therap. Drug Carrier Systems* 15:143-198, 1998, and references cited therein. Appropriate nucleic acid expression systems contain the

necessary DNA sequences for expression in the patient (such as a suitable promoter and terminating signal). Bacterial delivery systems involve the administration of a bacterium (such as *Bacillus-Calmette-Guerrin*) that expresses an immunogenic portion of the polypeptide on its cell surface or secretes such an epitope. In a preferred embodiment, the DNA may be introduced using a viral expression system (e.g., vaccinia or other pox virus, retrovirus, or adenovirus), which may involve the use of a non-pathogenic (defective), replication competent virus. Suitable systems are disclosed, for example, in Fisher-Hoch et al., *Proc. Natl. Acad. Sci. USA* 86:317-321, 1989; Flexner et al., *Ann. N.Y. Acad. Sci.* 569:86-103, 1989; Flexner et al., *Vaccine* 8:17-21, 1990; U.S. Patent Nos. 4,603,112, 4,769,330, and 5,017,487; WO 89/01973; U.S. Patent No. 4,777,127; GB 2,200,651; EP 0,345,242; WO 91/02805; Berkner, *Biotechniques* 6:616-627, 1988; Rosenfeld et al., *Science* 252:431-434, 1991; Kolls et al., *Proc. Natl. Acad. Sci. USA* 91:215-219, 1994; Kass-Eisler et al., *Proc. Natl. Acad. Sci. USA* 90:11498-11502, 1993; Guzman et al., *Circulation* 88:2838-2848, 1993; and Guzman et al., *Cir. Res.* 73:1202-1207, 1993. Techniques for incorporating DNA into such expression systems are well known to those of ordinary skill in the art. The DNA may also be "naked," as described, for example, in Ulmer et al., *Science* 259:1745-1749, 1993 and reviewed by Cohen, *Science* 259:1691-1692, 1993. The uptake of naked DNA may be increased by coating the DNA onto biodegradable beads, which are efficiently transported into the cells.

While any suitable carrier known to those of ordinary skill in the art may be employed in the pharmaceutical compositions of this invention, the type of carrier will vary depending on the mode of administration. Compositions of the present invention may be formulated for any appropriate manner of administration, including for example, topical, oral, nasal, intravenous, intracranial, intraperitoneal, subcutaneous or intramuscular administration. For parenteral administration, such as subcutaneous injection, the carrier preferably comprises water, saline, alcohol, a fat, a wax or a buffer. For oral administration, any of the above carriers or a solid carrier, such as mannitol, lactose, starch, magnesium stearate, sodium saccharine, talcum, cellulose, glucose, sucrose, and magnesium carbonate, may be employed. Biodegradable microspheres (e.g., polylactate polyglycolate) may also be employed as carriers for the pharmaceutical compositions of this invention. Suitable biodegradable microspheres are disclosed, for example, in U.S. Patent Nos. 4,897,268 and

5,075,109.

Such compositions may also comprise buffers (e.g., neutral buffered saline or phosphate buffered saline), carbohydrates (e.g., glucose, mannose, sucrose or dextrans), mannitol, proteins, polypeptides or amino acids such as glycine, antioxidants, chelating agents such as EDTA or glutathione, adjuvants (e.g., aluminum hydroxide) and/or preservatives. Alternatively, compositions of the present invention may be formulated as a lyophilizate. Compounds may also be encapsulated within liposomes using well known technology.

Any of a variety of immunostimulants may be employed in the vaccines of this invention. For example, an adjuvant may be included. Most adjuvants contain a substance designed to protect the antigen from rapid catabolism, such as aluminum hydroxide or mineral oil, and a stimulator of immune responses, such as lipid A, *Bordetella pertussis* or *Mycobacterium tuberculosis* derived proteins. Suitable adjuvants are commercially available as, for example, Freund's Incomplete Adjuvant and Complete Adjuvant (Difco Laboratories, Detroit, MI); Merck Adjuvant 65 (Merck and Company, Inc., Rahway, NJ); aluminum salts such as aluminum hydroxide gel (alum) or aluminum phosphate; salts of calcium, iron or zinc; an insoluble suspension of acylated tyrosine; acylated sugars; cationically or anionically derivatized polysaccharides; polyphosphazenes; biodegradable microspheres; monophosphoryl lipid A and quil A. Cytokines, such as GM-CSF or interleukin-2, -7, or -12, may also be used as adjuvants.

Within the vaccines provided herein, the adjuvant composition is preferably designed to induce an immune response predominantly of the Th1 type. High levels of Th1-type cytokines (e.g., IFN- γ , TNF α , IL-2 and IL-12) tend to favor the induction of cell mediated immune responses to an administered antigen. In contrast, high levels of Th2-type cytokines (e.g., IL-4, IL-5, IL-6 and IL-10) tend to favor the induction of humoral immune responses. Following application of a vaccine as provided herein, a patient will support an immune response that includes Th1- and Th2-type responses. Within a preferred embodiment, in which a response is predominantly Th1-type, the level of Th1-type cytokines will increase to a greater extent than the level of Th2-type cytokines. The levels of these cytokines may be readily assessed using standard assays. For a review of the families of cytokines, see Mosmann and Coffman, *Ann. Rev. Immunol.* 7:145-173, 1989.

Preferred adjuvants for use in eliciting a predominantly Th1-type response include, for example, a combination of monophosphoryl lipid A, preferably 3-de-O-acylated monophosphoryl lipid A (3D-MPL), together with an aluminum salt. MPL adjuvants are available from Ribi ImmunoChem Research Inc. (Hamilton, MT) (see US Patent Nos. 5 4,436,727; 4,877,611; 4,866,034 and 4,912,094). CpG-containing oligonucleotides (in which the CpG dinucleotide is unmethylated) also induce a predominantly Th1 response. Such oligonucleotides are well known and are described, for example, in WO 96/02555. Another preferred adjuvant is a saponin, preferably QS21, which may be used alone or in combination with other adjuvants. For example, an enhanced system involves the combination of a 10 monophosphoryl lipid A and saponin derivative, such as the combination of QS21 and 3D-MPL as described in WO 94/00153, or a less reactogenic composition where the QS21 is quenched with cholesterol, as described in WO 96/33739. Other preferred formulations comprises an oil-in-water emulsion and tocopherol. A particularly potent adjuvant formulation involving QS21, 3D-MPL and tocopherol in an oil-in-water emulsion is 15 described in WO 95/17210. Any vaccine provided herein may be prepared using well known methods that result in a combination of antigen, immune response enhancer and a suitable carrier or excipient.

The compositions described herein may be administered as part of a sustained release formulation (*i.e.*, a formulation such as a capsule, sponge or gel (composed of 20 polysaccharides, for example) that effects a slow release of compound following administration). Such formulations may generally be prepared using well known technology and administered by, for example, oral, rectal or subcutaneous implantation, or by implantation at the desired target site. Sustained-release formulations may contain a polypeptide, polynucleotide or antibody dispersed in a carrier matrix and/or contained within 25 a reservoir surrounded by a rate controlling membrane. Carriers for use within such formulations are biocompatible, and may also be biodegradable; preferably the formulation provides a relatively constant level of active component release. The amount of active compound contained within a sustained release formulation depends upon the site of implantation, the rate and expected duration of release and the nature of the condition to be 30 treated or prevented.

Any of a variety of delivery vehicles may be employed within pharmaceutical

compositions and vaccines to facilitate production of an antigen-specific immune response that targets tumor cells. Delivery vehicles include antigen presenting cells (APCs), such as dendritic cells, macrophages, B cells, monocytes and other cells that may be engineered to be efficient APCs. Such cells may, but need not, be genetically modified to increase the capacity for presenting the antigen, to improve activation and/or maintenance of the T cell response, to have anti-tumor effects *per se* and/or to be immunologically compatible with the receiver (*i.e.*, matched HLA haplotype). APCs may generally be isolated from any of a variety of biological fluids and organs, including tumor and peritumoral tissues, and may be autologous, allogeneic, syngeneic or xenogeneic cells.

10 Certain preferred embodiments of the present invention use dendritic cells or progenitors thereof as antigen-presenting cells. Dendritic cells are highly potent APCs (Banchereau and Steinman, *Nature* 392:245-251, 1998) and have been shown to be effective as a physiological adjuvant for eliciting prophylactic or therapeutic antitumor immunity (*see* Timmerman and Levy, *Ann. Rev. Med.* 50:507-529, 1999). In general, dendritic cells may be identified based on their typical shape (stellate *in situ*, with marked cytoplasmic processes (dendrites) visible *in vitro*), their ability to take up, process and present antigens with high efficiency, and their ability to activate naïve T cell responses. Dendritic cells may, of course, be engineered to express specific cell-surface receptors or ligands that are not commonly found on dendritic cells *in vivo* or *ex vivo*, and such modified dendritic cells are contemplated by the present invention. As an alternative to dendritic cells, secreted vesicles antigen-loaded dendritic cells (called exosomes) may be used within a vaccine (*see* Zitvogel et al., *Nature Med.* 4:594-600, 1998).

Dendritic cells and progenitors may be obtained from peripheral blood, bone marrow, tumor-infiltrating cells, peritumoral tissues-infiltrating cells, lymph nodes, spleen, skin, umbilical cord blood or any other suitable tissue or fluid. For example, dendritic cells may be differentiated *ex vivo* by adding a combination of cytokines such as GM-CSF, IL-4, IL-13 and/or TNF α to cultures of monocytes harvested from peripheral blood. Alternatively, CD34 positive cells harvested from peripheral blood, umbilical cord blood or bone marrow may be differentiated into dendritic cells by adding to the culture medium combinations of GM-CSF, IL-3, TNF α , CD40 ligand, LPS, flt3 ligand and/or other compound(s) that induce differentiation, maturation and proliferation of dendritic cells.

Dendritic cells are conveniently categorized as "immature" and "mature" cells, which allows a simple way to discriminate between two well characterized phenotypes. However, this nomenclature should not be construed to exclude all possible intermediate stages of differentiation. Immature dendritic cells are characterized as APC with a high capacity for antigen uptake and processing, which correlates with the high expression of Fcγ receptor and mannose receptor. The mature phenotype is typically characterized by a lower expression of these markers, but a high expression of cell surface molecules responsible for T cell activation such as class I and class II MHC, adhesion molecules (*e.g.*, CD54 and CD11) and costimulatory molecules (*e.g.*, CD40, CD80, CD86 and 4-1BB).

APCs may generally be transfected with a polynucleotide encoding a colon tumor protein (or portion or other variant thereof) such that the colon tumor polypeptide, or an immunogenic portion thereof, is expressed on the cell surface. Such transfection may take place *ex vivo*, and a composition or vaccine comprising such transfected cells may then be used for therapeutic purposes, as described herein. Alternatively, a gene delivery vehicle that targets a dendritic or other antigen presenting cell may be administered to a patient, resulting in transfection that occurs *in vivo*. *In vivo* and *ex vivo* transfection of dendritic cells, for example, may generally be performed using any methods known in the art, such as those described in WO 97/24447, or the gene gun approach described by Mahvi et al., *Immunology and cell Biology* 75:456-460, 1997. Antigen loading of dendritic cells may be achieved by incubating dendritic cells or progenitor cells with the colon tumor polypeptide, DNA (naked or within a plasmid vector) or RNA; or with antigen-expressing recombinant bacterium or viruses (*e.g.*, vaccinia, fowlpox, adenovirus or lentivirus vectors). Prior to loading, the polypeptide may be covalently conjugated to an immunological partner that provides T cell help (*e.g.*, a carrier molecule). Alternatively, a dendritic cell may be pulsed with a non-conjugated immunological partner, separately or in the presence of the polypeptide.

CANCER THERAPY

In further aspects of the present invention, the compositions described herein may be used for immunotherapy of cancer, such as colon cancer. Within such methods, pharmaceutical compositions and vaccines are typically administered to a patient. As used herein, a "patient" refers to any warm-blooded animal, preferably a human. A patient may or

may not be afflicted with cancer. Accordingly, the above pharmaceutical compositions and vaccines may be used to prevent the development of a cancer or to treat a patient afflicted with a cancer. A cancer may be diagnosed using criteria generally accepted in the art, including the presence of a malignant tumor. Pharmaceutical compositions and vaccines may be administered either prior to or following surgical removal of primary tumors and/or treatment such as administration of radiotherapy or conventional chemotherapeutic drugs.

Within certain embodiments, immunotherapy may be active immunotherapy, in which treatment relies on the *in vivo* stimulation of the endogenous host immune system to react against tumors with the administration of immune response-modifying agents (such as polypeptides and polynucleotides disclosed herein).

Within other embodiments, immunotherapy may be passive immunotherapy, in which treatment involves the delivery of agents with established tumor-immune reactivity (such as effector cells or antibodies) that can directly or indirectly mediate antitumor effects and does not necessarily depend on an intact host immune system. Examples of effector cells include T cells as discussed above, T lymphocytes (such as CD8⁺ cytotoxic T lymphocytes and CD4⁺ T-helper tumor-infiltrating lymphocytes), killer cells (such as Natural Killer cells and lymphokine-activated killer cells), B cells and antigen-presenting cells (such as dendritic cells and macrophages) expressing a polypeptide provided herein. T cell receptors and antibody receptors specific for the polypeptides recited herein may be cloned, expressed and transferred into other vectors or effector cells for adoptive immunotherapy. The polypeptides provided herein may also be used to generate antibodies or anti-idiotypic antibodies (as described above and in U.S. Patent No. 4,918,164) for passive immunotherapy.

Effector cells may generally be obtained in sufficient quantities for adoptive immunotherapy by growth *in vitro*, as described herein. Culture conditions for expanding single antigen-specific effector cells to several billion in number with retention of antigen recognition *in vivo* are well known in the art. Such *in vitro* culture conditions typically use intermittent stimulation with antigen, often in the presence of cytokines (such as IL-2) and non-dividing feeder cells. As noted above, immunoreactive polypeptides as provided herein may be used to rapidly expand antigen-specific T cell cultures in order to generate a sufficient number of cells for immunotherapy. In particular, antigen-presenting cells, such as dendritic, macrophage, monocyte, fibroblast and/or B cells, may be pulsed with immunoreactive

polypeptides or transfected with one or more polynucleotides using standard techniques well known in the art. For example, antigen-presenting cells can be transfected with a polynucleotide having a promoter appropriate for increasing expression in a recombinant virus or other expression system. Cultured effector cells for use in therapy must be able to grow and distribute widely, and to survive long term *in vivo*. Studies have shown that cultured effector cells can be induced to grow *in vivo* and to survive long term in substantial numbers by repeated stimulation with antigen supplemented with IL-2 (*see, for example, Cheever et al., Immunological Reviews 157:177, 1997*).

Alternatively, a vector expressing a polypeptide recited herein may be introduced into antigen presenting cells taken from a patient and clonally propagated *ex vivo* for transplant back into the same patient. Transfected cells may be reintroduced into the patient using any means known in the art, preferably in sterile form by intravenous, intracavitary, intraperitoneal or intratumor administration.

Routes and frequency of administration of the therapeutic compositions disclosed herein, as well as dosage, will vary from individual to individual, and may be readily established using standard techniques. In general, the pharmaceutical compositions and vaccines may be administered by injection (*e.g.*, intracutaneous, intramuscular, intravenous or subcutaneous), intranasally (*e.g.*, by aspiration) or orally. Preferably, between 1 and 10 doses may be administered over a 52 week period. Preferably, 6 doses are administered, at intervals of 1 month, and booster vaccinations may be given periodically thereafter. Alternate protocols may be appropriate for individual patients. A suitable dose is an amount of a compound that, when administered as described above, is capable of promoting an anti-tumor immune response, and is at least 10-50% above the basal (*i.e.*, untreated) level. Such response can be monitored by measuring the anti-tumor antibodies in a patient or by vaccine-dependent generation of cytolytic effector cells capable of killing the patient's tumor cells *in vitro*. Such vaccines should also be capable of causing an immune response that leads to an improved clinical outcome (*e.g.*, more frequent remissions, complete or partial or longer disease-free survival) in vaccinated patients as compared to non-vaccinated patients. In general, for pharmaceutical compositions and vaccines comprising one or more polypeptides, the amount of each polypeptide present in a dose ranges from about 25 μ g to 5 mg per kg of host. Suitable dose sizes will vary with the size of the patient,

but will typically range from about 0.1 mL to about 5 mL.

In general, an appropriate dosage and treatment regimen provides the active compound(s) in an amount sufficient to provide therapeutic and/or prophylactic benefit. Such a response can be monitored by establishing an improved clinical outcome (e.g., more frequent remissions, complete or partial, or longer disease-free survival) in treated patients as compared to non-treated patients. Increases in preexisting immune responses to a colon tumor protein generally correlate with an improved clinical outcome. Such immune responses may generally be evaluated using standard proliferation, cytotoxicity or cytokine assays, which may be performed using samples obtained from a patient before and after treatment.

METHODS FOR DETECTING CANCER

In general, a cancer may be detected in a patient based on the presence of one or more colon tumor proteins and/or polynucleotides encoding such proteins in a biological sample (for example, blood, sera, sputum, urine and/or tumor biopsies) obtained from the patient. In other words, such proteins may be used as markers to indicate the presence or absence of a cancer such as colon cancer. In addition, such proteins may be useful for the detection of other cancers. The binding agents provided herein generally permit detection of the level of antigen that binds to the agent in the biological sample. Polynucleotide primers and probes may be used to detect the level of mRNA encoding a tumor protein, which is also indicative of the presence or absence of a cancer. In general, a colon tumor sequence should be present at a level that is at least three fold higher in tumor tissue than in normal tissue.

There are a variety of assay formats known to those of ordinary skill in the art for using a binding agent to detect polypeptide markers in a sample. See, e.g., Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. In general, the presence or absence of a cancer in a patient may be determined by (a) contacting a biological sample obtained from a patient with a binding agent; (b) detecting in the sample a level of polypeptide that binds to the binding agent; and (c) comparing the level of polypeptide with a predetermined cut-off value.

In a preferred embodiment, the assay involves the use of binding agent immobilized on a solid support to bind to and remove the polypeptide from the remainder of

the sample. The bound polypeptide may then be detected using a detection reagent that contains a reporter group and specifically binds to the binding agent/polypeptide complex. Such detection reagents may comprise, for example, a binding agent that specifically binds to the polypeptide or an antibody or other agent that specifically binds to the binding agent, such as an anti-immunoglobulin, protein G, protein A or a lectin. Alternatively, a competitive assay may be utilized, in which a polypeptide is labeled with a reporter group and allowed to bind to the immobilized binding agent after incubation of the binding agent with the sample. The extent to which components of the sample inhibit the binding of the labeled polypeptide to the binding agent is indicative of the reactivity of the sample with the immobilized binding agent. Suitable polypeptides for use within such assays include full length colon tumor proteins and portions thereof to which the binding agent binds, as described above.

The solid support may be any material known to those of ordinary skill in the art to which the tumor protein may be attached. For example, the solid support may be a test well in a microtiter plate or a nitrocellulose or other suitable membrane. Alternatively, the support may be a bead or disc, such as glass, fiberglass, latex or a plastic material such as polystyrene or polyvinylchloride. The support may also be a magnetic particle or a fiber optic sensor, such as those disclosed, for example, in U.S. Patent No. 5,359,681. The binding agent may be immobilized on the solid support using a variety of techniques known to those of skill in the art, which are amply described in the patent and scientific literature. In the context of the present invention, the term "immobilization" refers to both noncovalent association, such as adsorption, and covalent attachment (which may be a direct linkage between the agent and functional groups on the support or may be a linkage by way of a cross-linking agent). Immobilization by adsorption to a well in a microtiter plate or to a membrane is preferred. In such cases, adsorption may be achieved by contacting the binding agent, in a suitable buffer, with the solid support for a suitable amount of time. The contact time varies with temperature, but is typically between about 1 hour and about 1 day. In general, contacting a well of a plastic microtiter plate (such as polystyrene or polyvinylchloride) with an amount of binding agent ranging from about 10 ng to about 10 μ g, and preferably about 100 ng to about 1 μ g, is sufficient to immobilize an adequate amount of binding agent.

Covalent attachment of binding agent to a solid support may generally be achieved by first reacting the support with a bifunctional reagent that will react with both the support and a functional group, such as a hydroxyl or amino group, on the binding agent. For example, the binding agent may be covalently attached to supports having an appropriate polymer coating using benzoquinone or by condensation of an aldehyde group on the support with an amine and an active hydrogen on the binding partner (*see, e.g.*, Pierce Immunotechnology Catalog and Handbook, 1991, at A12-A13).

In certain embodiments, the assay is a two-antibody sandwich assay. This assay may be performed by first contacting an antibody that has been immobilized on a solid support, commonly the well of a microtiter plate, with the sample, such that polypeptides within the sample are allowed to bind to the immobilized antibody. Unbound sample is then removed from the immobilized polypeptide-antibody complexes and a detection reagent (preferably a second antibody capable of binding to a different site on the polypeptide) containing a reporter group is added. The amount of detection reagent that remains bound to the solid support is then determined using a method appropriate for the specific reporter group.

More specifically, once the antibody is immobilized on the support as described above, the remaining protein binding sites on the support are typically blocked. Any suitable blocking agent known to those of ordinary skill in the art, such as bovine serum albumin or Tween 20TM (Sigma Chemical Co., St. Louis, MO). The immobilized antibody is then incubated with the sample, and polypeptide is allowed to bind to the antibody. The sample may be diluted with a suitable diluent, such as phosphate-buffered saline (PBS) prior to incubation. In general, an appropriate contact time (*i.e.*, incubation time) is a period of time that is sufficient to detect the presence of polypeptide within a sample obtained from an individual with colon cancer. Preferably, the contact time is sufficient to achieve a level of binding that is at least about 95% of that achieved at equilibrium between bound and unbound polypeptide. Those of ordinary skill in the art will recognize that the time necessary to achieve equilibrium may be readily determined by assaying the level of binding that occurs over a period of time. At room temperature, an incubation time of about 30 minutes is generally sufficient.

Unbound sample may then be removed by washing the solid support with an appropriate buffer, such as PBS containing 0.1% Tween 20™. The second antibody, which contains a reporter group, may then be added to the solid support. Preferred reporter groups include those groups recited above.

5 The detection reagent is then incubated with the immobilized antibody-polypeptide complex for an amount of time sufficient to detect the bound polypeptide. An appropriate amount of time may generally be determined by assaying the level of binding that occurs over a period of time. Unbound detection reagent is then removed and bound detection reagent is detected using the reporter group. The method employed for detecting
10 the reporter group depends upon the nature of the reporter group. For radioactive groups, scintillation counting or autoradiographic methods are generally appropriate. Spectroscopic methods may be used to detect dyes, luminescent groups and fluorescent groups. Biotin may be detected using avidin, coupled to a different reporter group (commonly a radioactive or fluorescent group or an enzyme). Enzyme reporter groups may generally be detected by the
15 addition of substrate (generally for a specific period of time), followed by spectroscopic or other analysis of the reaction products.

 To determine the presence or absence of a cancer, such as colon cancer, the signal detected from the reporter group that remains bound to the solid support is generally compared to a signal that corresponds to a predetermined cut-off value. In one preferred
20 embodiment, the cut-off value for the detection of a cancer is the average mean signal obtained when the immobilized antibody is incubated with samples from patients without the cancer. In general, a sample generating a signal that is three standard deviations above the predetermined cut-off value is considered positive for the cancer. In an alternate preferred
25 embodiment, the cut-off value is determined using a Receiver Operator Curve, according to the method of Sackett et al., *Clinical Epidemiology: A Basic Science for Clinical Medicine*, Little Brown and Co., 1985, p. 106-7. Briefly, in this embodiment, the cut-off value may be determined from a plot of pairs of true positive rates (i.e., sensitivity) and false positive rates (100%-specificity) that correspond to each possible cut-off value for the diagnostic test result. The cut-off value on the plot that is the closest to the upper left-hand corner (i.e., the value
30 that encloses the largest area) is the most accurate cut-off value, and a sample generating a signal that is higher than the cut-off value determined by this method may be considered

positive. Alternatively, the cut-off value may be shifted to the left along the plot, to minimize the false positive rate, or to the right, to minimize the false negative rate. In general, a sample generating a signal that is higher than the cut-off value determined by this method is considered positive for a cancer.

5 In a related embodiment, the assay is performed in a flow-through or strip test format, wherein the binding agent is immobilized on a membrane, such as nitrocellulose. In the flow-through test, polypeptides within the sample bind to the immobilized binding agent as the sample passes through the membrane. A second, labeled binding agent then binds to the binding agent-polypeptide complex as a solution containing the second binding agent
10 flows through the membrane. The detection of bound second binding agent may then be performed as described above. In the strip test format, one end of the membrane to which binding agent is bound is immersed in a solution containing the sample. The sample migrates along the membrane through a region containing second binding agent and to the area of immobilized binding agent. Concentration of second binding agent at the area of
15 immobilized antibody indicates the presence of a cancer. Typically, the concentration of second binding agent at that site generates a pattern, such as a line, that can be read visually. The absence of such a pattern indicates a negative result. In general, the amount of binding agent immobilized on the membrane is selected to generate a visually discernible pattern when the biological sample contains a level of polypeptide that would be sufficient to
20 generate a positive signal in the two-antibody sandwich assay, in the format discussed above. Preferred binding agents for use in such assays are antibodies and antigen-binding fragments thereof. Preferably, the amount of antibody immobilized on the membrane ranges from about 25 ng to about 1 μ g, and more preferably from about 50 ng to about 500 ng. Such tests can typically be performed with a very small amount of biological sample.

25 Of course, numerous other assay protocols exist that are suitable for use with the tumor proteins or binding agents of the present invention. The above descriptions are intended to be exemplary only. For example, it will be apparent to those of ordinary skill in the art that the above protocols may be readily modified to use colon tumor polypeptides to detect antibodies that bind to such polypeptides in a biological sample. The detection of such
30 colon tumor protein specific antibodies may correlate with the presence of a cancer.

A cancer may also, or alternatively, be detected based on the presence of T cells that specifically react with a colon tumor protein in a biological sample. Within certain methods, a biological sample comprising CD4⁺ and/or CD8⁺ T cells isolated from a patient is incubated with a colon tumor polypeptide, a polynucleotide encoding such a polypeptide and/or an APC that expresses at least an immunogenic portion of such a polypeptide, and the presence or absence of specific activation of the T cells is detected. Suitable biological samples include, but are not limited to, isolated T cells. For example, T cells may be isolated from a patient by routine techniques (such as by Ficoll/Hypaque density gradient centrifugation of peripheral blood lymphocytes). T cells may be incubated *in vitro* for 2-9 days (typically 4 days) at 37°C with one or more representative polypeptides (e.g., 5 - 25 µg/ml). It may be desirable to incubate another aliquot of a T cell sample in the absence of colon tumor polypeptide to serve as a control. For CD4⁺ T cells, activation is preferably detected by evaluating proliferation of the T cells. For CD8⁺ T cells, activation is preferably detected by evaluating cytolytic activity. A level of proliferation that is at least two fold greater and/or a level of cytolytic activity that is at least 20% greater than in disease-free patients indicates the presence of a cancer in the patient.

As noted above, a cancer may also, or alternatively, be detected based on the level of mRNA encoding a colon tumor protein in a biological sample. For example, at least two oligonucleotide primers may be employed in a polymerase chain reaction (PCR) based assay to amplify a portion of a colon tumor cDNA derived from a biological sample, wherein at least one of the oligonucleotide primers is specific for (*i.e.*, hybridizes to) a polynucleotide encoding the colon tumor protein. The amplified cDNA is then separated and detected using techniques well known in the art, such as gel electrophoresis. Similarly, oligonucleotide probes that specifically hybridize to a polynucleotide encoding a colon tumor protein may be used in a hybridization assay to detect the presence of polynucleotide encoding the tumor protein in a biological sample.

To permit hybridization under assay conditions, oligonucleotide primers and probes should comprise an oligonucleotide sequence that has at least about 60%, preferably at least about 75% and more preferably at least about 90%, identity to a portion of a polynucleotide encoding a colon tumor protein that is at least 10 nucleotides, and preferably at least 20 nucleotides, in length. Preferably, oligonucleotide primers and/or probes will

hybridize to a polynucleotide encoding a polypeptide disclosed herein under moderately stringent conditions, as defined above. Oligonucleotide primers and/or probes which may be usefully employed in the diagnostic methods described herein preferably are at least 10-40 nucleotides in length. In a preferred embodiment, the oligonucleotide primers comprise at least 10 contiguous nucleotides, more preferably at least 15 contiguous nucleotides, of a DNA molecule having a sequence recited in SEQ ID NO: 1-121, 123-197 and 205-486. Techniques for both PCR based assays and hybridization assays are well known in the art (see, for example, Mullis et al., *Cold Spring Harbor Symp. Quant. Biol.*, 51:263, 1987; Erlich ed., *PCR Technology*, Stockton Press, NY, 1989).

One preferred assay employs RT-PCR, in which PCR is applied in conjunction with reverse transcription. Typically, RNA is extracted from a biological sample, such as biopsy tissue, and is reverse transcribed to produce cDNA molecules. PCR amplification using at least one specific primer generates a cDNA molecule, which may be separated and visualized using, for example, gel electrophoresis. Amplification may be performed on biological samples taken from a test patient and from an individual who is not afflicted with a cancer. The amplification reaction may be performed on several dilutions of cDNA spanning two orders of magnitude. A two-fold or greater increase in expression in several dilutions of the test patient sample as compared to the same dilutions of the non-cancerous sample is typically considered positive.

In another embodiment, the disclosed compositions may be used as markers for the progression of cancer. In this embodiment, assays as described above for the diagnosis of a cancer may be performed over time, and the change in the level of reactive polypeptide(s) or polynucleotide evaluated. For example, the assays may be performed every 24-72 hours for a period of 6 months to 1 year, and thereafter performed as needed. In general, a cancer is progressing in those patients in whom the level of polypeptide or polynucleotide detected increases over time. In contrast, the cancer is not progressing when the level of reactive polypeptide or polynucleotide either remains constant or decreases with time.

Certain *in vivo* diagnostic assays may be performed directly on a tumor. One such assay involves contacting tumor cells with a binding agent. The bound binding agent may then be detected directly or indirectly via a reporter group. Such binding agents may

also be used in histological applications. Alternatively, polynucleotide probes may be used within such applications.

As noted above, to improve sensitivity, multiple colon tumor protein markers may be assayed within a given sample. It will be apparent that binding agents specific for
5 different proteins provided herein may be combined within a single assay. Further, multiple primers or probes may be used concurrently. The selection of tumor protein markers may be based on routine experiments to determine combinations that results in optimal sensitivity. In addition, or alternatively, assays for tumor proteins provided herein may be combined with assays for other known tumor antigens.

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DIAGNOSTIC KITS

The present invention further provides kits for use within any of the above diagnostic methods. Such kits typically comprise two or more components necessary for performing a diagnostic assay. Components may be compounds, reagents, containers and/or
15 equipment. For example, one container within a kit may contain a monoclonal antibody or fragment thereof that specifically binds to a colon tumor protein. Such antibodies or fragments may be provided attached to a support material, as described above. One or more additional containers may enclose elements, such as reagents or buffers, to be used in the assay. Such kits may also, or alternatively, contain a detection reagent as described above
20 that contains a reporter group suitable for direct or indirect detection of antibody binding.

Alternatively, a kit may be designed to detect the level of mRNA encoding a colon tumor protein in a biological sample. Such kits generally comprise at least one oligonucleotide probe or primer, as described above, that hybridizes to a polynucleotide encoding a colon tumor protein. Such an oligonucleotide may be used, for example, within a
25 PCR or hybridization assay. Additional components that may be present within such kits include a second oligonucleotide and/or a diagnostic reagent or container to facilitate the detection of a polynucleotide encoding a colon tumor protein.

The following Examples are offered by way of illustration and not by way of limitation.

EXAMPLES

5 Example 1

ISOLATION AND CHARACTERIZATION OF COLON TUMOR POLYPEPTIDES BY
PCR-BASED SUBTRACTION AND MICROARRAY ANALYSIS

A cDNA library was constructed in the PCR2.1 vector (Invitrogen, Carlsbad,
10 CA) by subtracting a pool of three colon tumors with a pool of normal colon, spleen, brain,
liver, kidney, lung, stomach and small intestine using PCR subtraction methodologies
(Clontech, Palo Alto, CA). The subtraction was performed using a PCR-based protocol,
which was modified to generate larger fragments. Within this protocol, tester and driver
double stranded cDNA were separately digested with five restriction enzymes that recognize
15 six-nucleotide restriction sites (MluI, MscI, PvuII, SalI and StuI). This digestion resulted in
an average cDNA size of 600 bp, rather than the average size of 300 bp that results from
digestion with RsaI according to the Clontech protocol. This modification did not affect the
subtraction efficiency. Two tester populations were then created with different adapters, and
the driver library remained without adapters.

20 The tester and driver libraries were then hybridized using excess driver cDNA.
In the first hybridization step, driver was separately hybridized with each of the two tester
cDNA populations. This resulted in populations of (a) unhybridized tester cDNAs, (b) tester
cDNAs hybridized to other tester cDNAs, (c) tester cDNAs hybridized to driver cDNAs, and
(d) unhybridized driver cDNAs. The two separate hybridization reactions were then
25 combined, and rehybridized in the presence of additional denatured driver cDNA. Following
this second hybridization, in addition to populations (a) through (d), a fifth population (e) was
generated in which tester cDNA with one adapter hybridized to tester cDNA with the second
adapter. Accordingly, the second hybridization step resulted in enrichment of differentially
expressed sequences which could be used as templates for PCR amplification with adaptor-
30 specific primers.

The ends were then filled in, and PCR amplification was performed using
adaptor-specific primers. Only population (e), which contained tester cDNA that did not

hybridize to driver cDNA, was amplified exponentially. A second PCR amplification step was then performed, to reduce background and further enrich differentially expressed sequences.

This PCR-based subtraction technique normalizes differentially expressed cDNAs so that rare transcripts that are over-expressed in colon tumor tissue may be recoverable. Such transcripts would be difficult to recover by traditional subtraction methods.

To characterize the complexity and redundancy of the subtracted library, 96 clones were randomly picked and 65 were sequenced, as previously described. These sequences were further characterized by comparison with the most recent Genbank database (April, 1998) to determine their degree of novelty. No significant homologies were found to 21 of these clones, hereinafter referred to as 11092, 11093, 11096, 11098, 11103, 11174, 11108, 11112, 11115, 11117, 11118, 11134, 11151, 11154, 11158, 11168, 11172, 11175, 11184, 11185 and 11187. The determined cDNA sequences for these clones are provided in SEQ ID NO: 48, 49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101 and 109-111, respectively.

Two-thousand clones from the above mentioned cDNA subtraction library were randomly picked and submitted to a round of PCR amplification. Briefly, 0.5 μ l of glycerol stock solution was added to 99.5 μ l of pcr MIX (80 μ l H₂O, 10 μ l 10X PCR Buffer, 6 μ l 25 mM MgCl₂, 1 μ l 10 mM dNTPs, 1 μ l 100 mM M13 forward primer (CACGACGTTGTAAAACGACGG), 1 μ l 100 mM M13 reverse primer (CACAGGAAACAGCTATGACC), and 0.5 μ l 5 u/ml Taq polymerase (primers provided by (Operon Technologies, Alameda, CA). The PCR amplification was run for thirty cycles under the following conditions: 95°C for 5 min., 92°C for 30 sec., 57°C for 40 sec., 75°C for 2 min. and 75°C for 5 minutes.

mRNA expression levels for representative clones were determined using microarray technology (Synteni, Palo Alto, CA) in colon tumor tissues (n=25), normal colon tissues (n=6), kidney, lung, liver, brain, heart, esophagus, small intestine, stomach, pancreas, adrenal gland, salivary gland, resting PBMC, activated PBMC, bone marrow, dendritic cells, spinal cord, blood vessels, skeletal muscle, skin, breast and fetal tissues. The number of tissue samples tested in each case was one (n=1), except where specifically noted above; additionally, all the above-mentioned tissues were derived from humans. The PCR

amplification products were dotted onto slides in an array format, with each product occupying a unique location in the array. mRNA was extracted from the tissue sample to be tested, and fluorescent-labeled cDNA probes were generated by reverse transcription according to the protocol provided by Synteni. The microarrays were probed with the labeled
5 cDNA probes, the slides scanned, and fluorescence intensity was measured. This intensity correlates with the hybridization intensity.

One hundred and forty nine clones showed two or more fold over-expression in the colon tumor probe group as compared to the normal tissue probe group. These cDNA clones were further characterized by DNA sequencing with a Perkin Elmer/Applied
10 Biosystems Division Automated Sequencer Model 373A and/or Model 377 (Foster City, CA). These sequences were compared to known sequences in the most recent GenBank database. No significant homologies to human gene sequences were found in forty nine of these clones, represented by the following sixteen cDNA consensus sequences: SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-34, 36, 38, 40, 41, 46 and 47, hereinafter referred to as Contig 2, 8,
15 13, 14, 20, 23, 29, 31, 35, 32, 36, 38, 41, 42, 50 and 51, respectively). Contig 29 (SEQ ID NO: 30) was found to be a Rat GSK-3- β -interacting protein Axil homolog. Also, Contigs 31 and 35 (SEQ ID NO: 32 and 33, respectively) were found to be a Mus musculus GOB-4 homolog. The determined cDNA sequences of SEQ ID NO: 1, 3-7, 9-14, 17-21, 23, 25-29, 31, 35, 37, 39, 42-45, 50, 51, 53, 55-58, 61-64, 70-78, 80-88, 91, 92, 94-98, 102-108 and 112
20 were found to show some homology to previously identified genes sequences.

Microarray analysis demonstrated Contig 2 (SEQ ID NO: 2) showed over-expression in 34% of colon tumors tested, as well as increased expression in normal pancreatic tissue, with no over-expression in normal colon tissues. Upon further analysis, Contigs 2, 8 and 23 were found to share homology to the known gene GW112. Contigs 4, 5,
25 9 and 52 showed homology to carcinoembryonic antigen (SEQ ID NO: 3, 4, 5 and 6, respectively). A representative sampling of these fragments showed over-expression in 85% of colon tumors, with over-expression in normal bone marrow and 3/6 normal colon tissues. Contig 6 (SEQ ID NO: 7), showing homology to the known gene sequence for villin, and was over-expressed in about half of all colon tumors tested, with a limited degree of low level
30 over-expression in normal colon. Contig 12 (SEQ ID NO: 14), showing homology to Chromosome 17, clone hRPC.1171_I_10, also referred to as C798P, was over-expressed in

approximately 70% of colon tumors tested, with low over-expression in 1/6 normal colon samples. Contig 14, also referred to as 14261 (SEQ ID NO: 16), showing no significant homology to any known gene, showed over-expression in 44% of colon tumors tested, with low level expression in half of normal colon tissues, as well as small intestine and pancreatic tissue. Contig 18 (SEQ ID NO: 21), showing homology to the known gene for L1-cadherin, showed over-expression in approximately half of colon tumors and low level over-expression in 3/6 normal colon tissues tested. Contig 22 (SEQ ID NO: 23), showing homology to Bumetanide-sensitive Na-K-Cl cotransporter was over-expressed in 70% of colon tumors and no over-expression in all normal tissues tested. Contig 25 (SEQ ID NO: 25), showing homology to macrophage inflammatory protein-3 α , was over-expressed in over 40% of colon tumors and in activated PBMC. Contigs 26 and 48 (SEQ ID NOS: 25 and 26), showing homology to the sequence for laminin, was over-expressed in 48% of colon tumors and with low over-expression in stomach tissue. Contig 28 (SEQ ID NO: 29), showing homology to the known gene sequence for Chromosome 16 BAC clone CIT987SK-A-363E6, was over-expressed in 33% of colon tumors tested with normal stomach and 2/6 normal colon tissues showing low level over-expression. Contigs 29, 31 and 35 (SEQ ID NOS: 30, 32 and 33, respectively), also referred to as C751P, an unknown sequence showing limited and partial homology to Rat GSK-3 β -interacting protein Axil homolog and Mus musculus GOB-4 homolog, was over-expressed in 74% of colon tumors and no over-expression in all normal tissues tested. Contig 34 (SEQ ID NO: 35), showing homology to the known sequence for desmoglein 2, was over-expressed in 56% of colon tumors and showed low level over-expression in 1/6 normal colon tissues. Contig 36 (SEQ ID NO: 36), an unknown sequence also referred to as C793P, showed over-expression in 30% of colon tumor tissues tested. Contig 37 and 14287.2 (SEQ ID NOS: 37 and 116), an unknown sequence, but with limited (89%) homology to the known sequence for putative transmembrane protein was over-expressed in 70% of colon tumors, as well as in normal lung tissue and 3/6 normal colon tissues tested. Contig 38, also referred to as C796P and 14219 (SEQ ID NO: 38), showing no significant homology to any known gene, was over-expressed in 38% in colon tumors and no elevated over-expression in any normal tissues. Contig 41 (SEQ ID NO: 40), also referred to as C799P and 14308, an unknown sequence showing no significant homology to any known gene, was over-expressed in 22% of colon tumors. Contig 42, (SEQ ID NO: 41), also

referred to as C794P and 14309, an unknown sequence with no significant homology to any known gene, was over-expressed in 63% of colon tumors tested, as well as in 3/6 normal colon tissues. Contig 43 (SEQ ID NO: 42), showing homology to the known sequence for Chromosome 1 specific transcript KIAA0487 was over-expressed in 85% of colon tumors tested and in normal lung and 4/6 normal colon tissues. Contig 49 (SEQ ID NO: 45), showing homology to the known sequence for pump-1, was over-expressed in 44% of colon tumors and no over-expression in all normal tissues tested. Contig 50 (SEQ ID NO: 46), also referred to as C792P and 18323, showing no significant homology to any known gene, was over-expressed in 33% of colon tumors with no detectable over-expression in any normal tissues tested. Contig 51 (SEQ ID NO: 47), also referred to as C795P and 14317 was over-expressed in 11% of colon tumors.

Additional microarray analysis yielded seven clones showing two or more fold over-expression in the colon tumor probe group as compared to the normal tissue probe group. Three of these clones demonstrated particularly good colon tumor specificity, and are represented by SEQ ID NO: 115, 116 and 120. Specifically, SEQ ID NO: 115, referred to as C791P or 14235, which shows homology to the known gene sequence for H. sapiens chromosome 21 derived BAC containing ets-2 gene, was over-expressed in 89% of colon tumors tested and in 5/6 normal colon tissues, as well as over-expressed at low levels in normal lung and activated PBMC. Microarray analysis for SEQ ID NO: 116 is discussed above. SEQ ID NO: 120, referred to as 14295, showing homology to the known gene sequence for secreted cement gland protein XAG-2 homolog, was over-expressed in 70% of colon tumors and in 5/6 normal colon tissues, as well as low level over-expression in normal small intestine, stomach and lung. All clones showing over-expression in colon tumor were sequenced and these sequences compared to the most recent Genbank database (February 12, 1999). Of the seven clones, three contained sequences that did not share significant homology to any known gene sequences, represented by SEQ ID NO: 116, 117 and 119. To the best of the inventors' knowledge, none of these sequences have been previously shown to be present in colon. The determined cDNA sequences of the remaining clones (SEQ ID NO: 113-115 and 120) were found to show some homology to previously identified genes.

Further analysis identified a clone which was recovered several times by PCR subtraction and by expression screening using a mouse anti-scld antiserum. The determined

full length cDNA sequence for this clone is provided in SEQ ID NO: 121, with the corresponding predicted amino acid sequence being provided in SEQ ID NO: 122. This clone is homologous with the known gene Beta IG-H3, as disclosed in U.S. Patent No. 5,444,164. Microarray analysis demonstrated this clone to be over-expressed in 75 to 80% of colon tumors tested (n=27), with no over-expression in normal colon samples (n=6), but with some low level over-expression in other normal tissues tested.

Further analysis of the PCR-subtraction library described above led to the isolation of longer cDNA sequences for the clones of SEQ ID NO: 30, 115, 46, 118, 41, 47, 38, 113, 14 and 40 (known as C751P, C791P, C792P, C793P, C794P, C795P, C796P, C797P, C798P and C799P, respectively). These determined cDNA sequences are provided in SEQ ID NO: 123-132, respectively.

Using PCR subtraction methodology described above with minor modifications, transcripts from a pool of three moderately differentiated colon adenocarcinoma samples were subtracted with a set of transcripts from normal brain, pancreas, bone marrow, liver, heart, lung, stomach and small intestine. Modifications of the above protocol were included at the cDNA digestion steps and in the tester to drive hybridization ratios. In a first subtraction, the restriction enzymes PvuII, DraI, MscI and StuI were used to digest cDNAs, and the tester to driver ratio was 1:40, as suggested by Clontech. In a second subtraction, DraI, MscI and StuI were used for cDNA digestion and a tester to driver ratio of 1:76 was used. Following the PCR amplification steps, the cDNAs were clones into pCR2.1 plasmid vector. The determined cDNA sequences of 167 isolated clones are provided in SEQ ID NO: 205-371. These sequences were compared to sequences in the public databases as described above. The sequences of SEQ ID NO: 205, 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279, 282, 291, 293, 294, 298, 300, 302, 303, 310-313, 315, 317, 320, 322, 324, 332-335, 345, 347, 356, 358, 361, 362, 366, 369 and 371 were found to show some homology to previously identified ESTs. The remaining sequences were found to show some homology to previously identified genes.

Using the PCR subtraction technology described above, a cDNA library from a pool of primary colon tumors was subtracted with a cDNA library prepared from normal tissues, including brain, bone marrow, kidney, heart, lung, liver, pancreas, small intestine,

stomach and trachea. The determined cDNA sequences for 90 clones isolated in this subtraction are provided in SEQ ID NO: 372-461. Comparison of these sequences with those in the public databases as described above, revealed no homologies to the sequences of SEQ ID NO: 426, 445 and 453. The sequences of SEQ ID NO: 372-378, 380-404, 406, 409-417, 419-423, 425, 427-429, 433-436, 438-441, 443, 446-451, 454, 455 and 457-461 showed some homology to previously identified genes, while the sequences of SEQ ID NO: 379, 405, 407, 408, 418, 424, 430-432, 437, 442, 444, 452 and 456 showed some homology to previously isolated ESTs.

Example 2

ISOLATION OF TUMOR POLYPEPTIDES USING SCID-PASSAGED TUMOR RNA

Human colon tumor antigens were obtained using SCID mouse passaged colon tumor RNA as follows. Human colon tumor was implanted in SCID mice and harvested, as described in Patent Application Serial No. 08/556,659 filed 11/13/95, U.S. Patent No. 5,986,170. First strand cDNA was synthesized from poly A+ RNA from three SCID mouse-passaged colon tumors using a Lambda ZAP Express cDNA synthesis kit (Stratagene). The reactions were pooled and digested with RNase A, T1 and H to cleave the RNA and then treated with NaOH to degrade the RNA. The resulting cDNA was annealed with biotinylated (Vector Labs, Inc., Burlingame, CA) cDNA from a normal resting PBMC plasmid library (constructed from Superscript plasmid System, Gibco BRL), and subtracted with streptavidin by phenol/chloroform extraction. Second strand cDNA was synthesized from the subtracted first strand cDNA and digested with S1 nuclease (Gibco BRL). The cDNA was blunted with Pfu polymerase and EcoRI adaptors (Stratagene) were ligated to the ends. The cDNA was phosphorylated with T4 polynucleotide kinase, digested with restriction endonuclease XhoI, and size selected with Sephacryl S-400 (Sigma). Fractions were pooled, ligated to Lambda ZAP Express arms (Stratagene) and packaged with Gigapack Gold III extract (Stratagene). Random plaques were picked, phagemid was excised, transformed into XL0LR cells (Stratagene) and resulting plasmid DNA (Qiagen Inc., Valencia, CA) was sequenced as described above. The determined cDNA sequences for 17

clones isolated as described above are provided in SEQ ID NO: 133-151, wherein 133 and 134 represent partial sequences of a clone referred to as CoSub-3 and SEQ ID NO: 135 and 136 represent partial sequences of a clone referred to as CoSub-13. These sequences were compared with those in the public databases as described above. The sequences of SEQ ID NO: 139 and 149 showed no significant homologies to any previously identified sequences. The sequences of SEQ ID NO: 138, 140, 141, 142, 143, 148 and 149 showed some homology to previously isolated expressed sequence tags (ESTs). The sequences of SEQ ID NO: 133-137, 144-147, 150 and 151 showed some homology to previously isolated gene sequences.

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Example 3

USE OF MOUSE ANTISERA TO IDENTIFY DNA SEQUENCES ENCODING COLON TUMOR ANTIGENS

This example illustrates the isolation of cDNA sequences encoding colon tumor antigens by screening of colon tumor cDNA libraries with mouse anti-tumor sera.

A cDNA expression library was prepared from SCID mouse-passaged human colon tumor poly A+ RNA using a Stratagene (La Jolla, CA) Lambda ZAP Express kit, following the manufacturer's instructions. Sera was obtained from the colon tumor-bearing SCID mouse. This serum was injected into normal mice to produce anti-colon tumor serum. Approximately 600,000 PFUs were screened from the unamplified library using this antiserum. Using a goat anti-mouse IgG-A-M (H+L) alkaline phosphatase second antibody developed with NBT/BCIP (BRL Labs.), positive plaques were identified. Phage was purified and phagemid excised for several clones with inserts in a pBK-CMV vector for expression in prokaryotic or eukaryotic cells.

The determined cDNA sequences for 46 of the isolated clones are provided in SEQ ID NO: 152-197. The predicted amino acid sequences for the cDNA sequences of SEQ ID NO: 187, 188, 189, 190, 194, 195 and 197 are provided in SEQ ID NO: 198-204, respectively. The determined cDNA sequences were compared with those in the public database as described above. The sequences of SEQ ID NO: 156, 168, 184, 189, 192 and 196 showed some homology to previously isolated ESTs. The sequences of SEQ ID NO: 152-

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155, 157-167, 169-182, 183, 185-188, 190, 194, 195 and 197 showed some homology to previously identified genes.

Example 4

ISOLATION AND CHARACTERIZATION OF COLON TUMOR POLYPEPTIDES BY CONVENTIONAL SUBTRACTION

Two cDNA libraries were constructed and used to create a subtracted cDNA library as follows.

Using the GibcoBRL Superscript Plasmid System with minor modifications, two cDNA libraries were created. The first library, referred to as CTCL, was prepared from a pool of mRNA samples from three colon adenocarcinoma tissue samples. Two of the samples were described as Duke's stage C and one as Duke's stage B. All three samples were grade III in histological status. A second library (referred to as DriverLibpcDNA3.1+) was prepared from a pool of normal tissues, namely liver, pancreas, skin, bone marrow, resting PBMC, stomach and brain. Both libraries were prepared using the manufacturer's instructions with the following modifications: an EcoRI-NotI 5' cDNA adapter was used instead of the provided reagent; the vector pCDNA3.1(+) (Invitrogen) was substituted for the pSPORT vector; and the ligated DNA molecules were transformed into ElectroMaxDH10B electrocompetent cells. Clones from the libraries were analyzed by restriction digest and sequencing to determine average insert size, quality of the library and complexity of the library. DNA was prepared from each library and digested.

The driver DNA was biotinylated and hybridized with the colon library tester DNA at a ratio of 10:1. After two rounds of hybridizations, streptavidin incubations and extractions, the remaining colon cDNAs were size-selected by column chromatography and cloned into the pCMV-Script vector from Stratagene. Clones from this subtracted library (referred to as CTCL-S1) were characterized as described above for the unsubtracted libraries.

The determined cDNA sequences for 18 clones isolated from the CTCL-S1 library are provided in SEQ ID NO: 462-479. Comparison of these sequences with those in the public databases, as described above, revealed no significant homologies to the sequences

of SEQ ID NO: 476, 477 and 479. The remaining sequences showed some homology to previously identified genes.

In further studies, a cDNA library was prepared from a pool of mRNA from three metastatic colon adenocarcinomas derived from liver tissue samples. All samples were described as Duke's stage D. Conventional subtraction was performed as described above, using the DriverLibpcDNA3.1+ library described above as the driver. The resulting subtracted library (referred to as CMCL-S1) was characterized by isolating a set of clones for restriction analysis and sequencing.

The determined cDNA sequences for 7 clones isolated from the CMCL-S1 library are provided in SEQ ID NO: 480-486. Comparison of these sequences with those in the public databases revealed no significant homologies to the sequence of SEQ ID NO: 483. The sequences of SEQ ID NO: 480-482 and 484-486 were found to show some homology to previously identified genes.

Example 5

SYNTHESIS OF POLYPEPTIDES

Polypeptides may be synthesized on a Perkin Elmer/Applied Biosystems Division 430A peptide synthesizer using Fmoc chemistry with HPTU (O-Benzotriazole-N,N,N',N'-tetramethyluronium hexafluorophosphate) activation. A Gly-Cys-Gly sequence may be attached to the amino terminus of the peptide to provide a method of conjugation, binding to an immobilized surface, or labeling of the peptide. Cleavage of the peptides from the solid support may be carried out using the following cleavage mixture: trifluoroacetic acid:ethanedithiol:thioanisole:water:phenol (40:1:2:2:3). After cleaving for 2 hours, the peptides may be precipitated in cold methyl-t-butyl-ether. The peptide pellets may then be dissolved in water containing 0.1% trifluoroacetic acid (TFA) and lyophilized prior to purification by C18 reverse phase HPLC. A gradient of 0%-60% acetonitrile (containing 0.1% TFA) in water (containing 0.1% TFA) may be used to elute the peptides. Following lyophilization of the pure fractions, the peptides may be characterized using electrospray or other types of mass spectrometry and by amino acid analysis.

From the foregoing it will be appreciated that, although specific embodiments of the invention have been described herein for purposes of illustration, various modifications may be made without deviating from the spirit and scope of the invention. Accordingly, the invention is not limited except as by the appended claims.

CLAIMS

1. An isolated polypeptide comprising at least an immunogenic portion of a colon tumor protein, or a variant thereof, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

5 (a) sequences recited in SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111, 116-119, 123-132, 138-142, 143, 148, 149, 156, 168, 170-182, 184, 189, 191-193, 196, 205, 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279, 282, 291, 293, 294, 298, 300, 302, 303, 310-313, 315, 317, 320, 322, 324, 332-335, 345, 347, 356, 358, 361, 362, 366, 369, 371-378, 380-404, 406, 409-417, 419-423, 425, 427-429, 433-436, 438-441, 10 443, 446-451, 454, 455, 457-461, 476, 477, 479 and 483;

(b) sequences that hybridize to a sequence of SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111, 116-119, 123-132, 138-142, 143, 148, 149, 156, 168, 170-182, 184, 189, 191-193, 196, 205, 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279, 282, 291, 293, 294, 298, 300, 302, 303, 310-313, 315, 317, 320, 322, 324, 332-335, 345, 347, 356, 358, 361, 362, 366, 369, 371-378, 380-404, 406, 409-417, 419-423, 425, 427-429, 433-436, 438-441, 443, 446-451, 454, 455, 457-461, 476, 477, 479 and 20 483 under moderately stringent conditions; and

25 (c) a complement of a sequence of (a) or (b).

2. An isolated polypeptide according to claim 1, wherein the polypeptide comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111, 116-119, 123-132, 138-142, 143, 148, 149, 156, 168, 30 65-69, 79, 89, 90, 93, 99-101, 109-111, 116-119, 123-132, 138-142, 143, 148, 149, 156, 168,

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3. An isolated polypeptide comprising a sequence recited in any one of SEQ ID NO: 122 and 198-204.

10 4. An isolated polynucleotide encoding at least 15 amino acid residues of a colon tumor protein, or a variant thereof that differs in one or more substitutions, deletions, additions and/or insertions such that the ability of the variant to react with antigen-specific antisera is not substantially diminished, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide comprising a sequence recited in any one of 15 SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111, 116-119, 123-132, 138-142, 143, 148, 149, 156, 168, 170-182, 184, 189, 191-193, 196, 205, 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279, 282, 291, 293, 294, 298, 300, 302, 303, 310-313, 315, 317, 320, 322, 324, 332-335, 345, 347, 356, 20 358, 361, 362, 366, 369, 371-378, 380-404, 406, 409-417, 419-423, 425, 427-429, 433-436, 438-441, 443, 446-451, 454, 455, 457-461, 476, 477, 479 and 483 or a complement of any of the foregoing sequences.

5. An isolated polynucleotide encoding a colon tumor protein, or a variant 25 thereof, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide comprising a sequence recited in any one of SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111, 116-119, 123-132, 138-142, 143, 148, 149, 156, 168, 170-182, 184, 189, 191-193, 196, 205, 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 30 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279, 282, 291, 293, 294, 298, 300, 302, 303,

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5 6. An isolated polynucleotide comprising a sequence recited in any one of SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111, 116-119, 123-132, 138-142, 143, 148, 149, 156, 168, 170-182, 184, 189, 191-193, 196, 205, 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279, 10 282, 291, 293, 294, 298, 300, 302, 303, 310-313, 315, 317, 320, 322, 324, 332-335, 345, 347, 356, 358, 361, 362, 366, 369, 371-378, 380-404, 406, 409-417, 419-423, 425, 427-429, 433-436, 438-441, 443, 446-451, 454, 455, 457-461, 476, 477, 479 and 483.

 7. An isolated polynucleotide comprising a sequence that hybridizes to a 15 sequence recited in any one of SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111, 116-119, 123-132, 138-142, 143, 148, 149, 156, 168, 170-182, 184, 189, 191-193, 196, 205, 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279, 282, 291, 293, 294, 298, 300, 302, 303, 310-313, 315, 317, 320, 20 322, 324, 332-335, 345, 347, 356, 358, 361, 362, 366, 369, 371-378, 380-404, 406, 409-417, 419-423, 425, 427-429, 433-436, 438-441, 443, 446-451, 454, 455, 457-461, 476, 477, 479 and 483 under moderately stringent conditions.

 8. An isolated polynucleotide complementary to a polynucleotide 25 according to any one of claims 4-7.

 9. An expression vector comprising a polynucleotide according to any one of claims claim 4-8.

30 10. A host cell transformed or transfected with an expression vector according to claim 9.

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11. An isolated antibody, or antigen-binding fragment thereof, that specifically binds to a colon tumor protein that comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111, 116-119, 123-132, 138-142, 143, 148, 149, 156, 168, 170-182, 184, 189, 191-193, 196, 205, 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279, 282, 291, 293, 294, 298, 300, 302, 303, 310-313, 315, 317, 320, 322, 324, 332-335, 345, 347, 356, 358, 361, 362, 366, 369, 371-378, 380-404, 406, 409-417, 419-423, 425, 427-429, 433-436, 438-441, 443, 446-451, 454, 455, 457-461, 476, 477, 479 and 483 or a complement of any of the foregoing polynucleotide sequences.

12. A fusion protein comprising at least one polypeptide according to claim 1.

13. A fusion protein according to claim 12, wherein the fusion protein comprises an expression enhancer that increases expression of the fusion protein in a host cell transfected with a polynucleotide encoding the fusion protein.

14. A fusion protein according to claim 12, wherein the fusion protein comprises a T helper epitope that is not present within the polypeptide of claim 1.

15. A fusion protein according to claim 12, wherein the fusion protein comprises an affinity tag.

16. An isolated polynucleotide encoding a fusion protein according to claim 12.

17. A pharmaceutical composition comprising a physiologically acceptable carrier and at least one component selected from the group consisting of:

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- 5
- (a) a polypeptide according to claim 1;
 - (b) a polynucleotide according to claim 4;
 - (c) an antibody according to claim 11;
 - (d) a fusion protein according to claim 12; and
 - (e) a polynucleotide according to claim 16.

18. A vaccine comprising an immunostimulant and at least one component selected from the group consisting of:

- 10
- (a) a polypeptide according to claim 1;
 - (b) a polynucleotide according to claim 4;
 - (c) an antibody according to claim 11;
 - (d) a fusion protein according to claim 12; and
 - (e) a polynucleotide according to claim 16.

15 19. A vaccine according to claim 18, wherein the immunostimulant is an adjuvant.

20. A vaccine according to any claim 18, wherein the immunostimulant induces a predominantly Type I response.

20 21. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a pharmaceutical composition according to claim 17.

25 22. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a vaccine according to claim 20.

30 23. A pharmaceutical composition comprising an antigen-presenting cell that expresses a polypeptide according to claim 1, in combination with a pharmaceutically acceptable carrier or excipient.

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24. A pharmaceutical composition according to claim 23, wherein the antigen presenting cell is a dendritic cell or a macrophage.

25. A vaccine comprising an antigen-presenting cell that expresses a polypeptide according to claim 1, in combination with an immunostimulant.

26. A vaccine according to claim 25, wherein the immunostimulant is an adjuvant.

27. A vaccine according to claim 25, wherein the immunostimulant induces a predominantly Type I response.

28. A vaccine according to claim 25, wherein the antigen-presenting cell is a dendritic cell.

29. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of an antigen-presenting cell that expresses a polypeptide encoded by a polynucleotide recited in any one of SEQ ID NO: 1-121, 123-197 and 205-486, and thereby inhibiting the development of a cancer in the patient.

30. A method according to claim 29, wherein the antigen-presenting cell is a dendritic cell.

31. A method according to any one of claims 21, 22 and 29, wherein the cancer is colon cancer.

32. A method for removing tumor cells from a biological sample, comprising contacting a biological sample with T cells that specifically react with a colon tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(i) polynucleotides recited in any one of SEQ ID NO: 1-121, 123-

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197 and 205-486; and

(ii) complements of the foregoing polynucleotides;

wherein the step of contacting is performed under conditions and for a time sufficient to permit the removal of cells expressing the antigen from the sample.

5

33. A method according to claim 32, wherein the biological sample is blood or a fraction thereof.

34. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient a biological sample treated according to the method of claim 50.

35. A method for stimulating and/or expanding T cells specific for a colon tumor protein, comprising contacting T cells with at least one component selected from the group consisting of:

- (i) a polypeptide according to claim 1;
 - (ii) a polypeptide encoded by a polynucleotide comprising a sequence provided in any one of SEQ ID NO: 1-121, 123-197 and 205-486;
 - (iii) a polynucleotide encoding a polypeptide of (i) or (ii); and
 - (iv) an antigen presenting cell that expresses a polypeptide of (i) or (ii),
- under conditions and for a time sufficient to permit the stimulation and/or expansion of T cells.

36. An isolated T cell population, comprising T cells prepared according to the method of claim 35.

37. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a T cell population according to claim 36.

30

38. A method for inhibiting the development of a cancer in a patient,

comprising the steps of:

(a) incubating CD4⁺ and/or CD8⁺ T cells isolated from a patient with at least one component selected from the group consisting of:

- (i) a polypeptide according to claim 1;
- (ii) a polypeptide encoded by a polynucleotide comprising a sequence of any one of SEQ ID NO: 1-121, 123-197 and 205-486;
- (iii) a polynucleotide encoding a polypeptide of (i) or (ii); and
- (iv) an antigen-presenting cell that expresses a polypeptide of (i) or (ii);

such that T cells proliferate; and

(b) administering to the patient an effective amount of the proliferated T cells, and thereby inhibiting the development of a cancer in the patient.

39. A method for inhibiting the development of a cancer in a patient, comprising the steps of:

(a) incubating CD4⁺ and/or CD8⁺ T cells isolated from a patient with at least one component selected from the group consisting of:

- (i) a polypeptide according to claim 1;
- (ii) a polypeptide encoded by a polynucleotide comprising a sequence of any one of SEQ ID NO: 1-121, 123-197 and 205-486;
- (iii) a polynucleotide encoding a polypeptide of (i) or (ii); and
- (iii) an antigen-presenting cell that expresses a polypeptide of (i) or (ii);

such that T cells proliferate;

(b) cloning at least one proliferated cell to provide cloned T cells; and
(c) administering to the patient an effective amount of the cloned T cells, and thereby inhibiting the development of a cancer in the patient.

40. A method for determining the presence or absence of a cancer in a

patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient with a binding agent that binds to a colon tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

5 (i) polynucleotides recited in any one of SEQ ID NO: 1-121, 123-197 and 205-486; and

(ii) complements of the foregoing polynucleotides;

(b) detecting in the sample an amount of polypeptide that binds to the binding agent; and

10 (c) comparing the amount of polypeptide to a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient.

41. A method according to claim 40, wherein the binding agent is an antibody.

15

42. A method according to claim 43, wherein the antibody is a monoclonal antibody.

43. A method according to claim 40, wherein the cancer is colon cancer.

20

44. A method for monitoring the progression of a cancer in a patient, comprising the steps of:

25 (a) contacting a biological sample obtained from a patient at a first point in time with a binding agent that binds to a colon tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NO: 1-121, 123-197 and 205-486 or a complement of any of the foregoing polynucleotides;

(b) detecting in the sample an amount of polypeptide that binds to the binding agent;

30 (c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and

(d) comparing the amount of polypeptide detected in step (c) to the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

5 45. A method according to claim 44, wherein the binding agent is an antibody.

 46. A method according to claim 45, wherein the antibody is a monoclonal antibody.

10 47. A method according to claim 44, wherein the cancer is a colon cancer.

 48. A method for determining the presence or absence of a cancer in a patient, comprising the steps of:

15 (a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a colon tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NO: 1-121, 123-197 and 205-486 or a complement of any of the foregoing polynucleotides;

20 (b) detecting in the sample an amount of a polynucleotide that hybridizes to the oligonucleotide; and

 (c) comparing the amount of polynucleotide that hybridizes to the oligonucleotide to a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient.

25 49. A method according to claim 48, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a polymerase chain reaction.

 50. A method according to claim 48, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a hybridization assay.

30

 51. A method for monitoring the progression of a cancer in a patient,

comprising the steps of:

(a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a colon tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NO: 1-121, 123-197 and 205-486 or a complement of any of the foregoing polynucleotides;

(b) detecting in the sample an amount of a polynucleotide that hybridizes to the oligonucleotide;

(c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and

(d) comparing the amount of polynucleotide detected in step (c) to the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

52. A method according to claim 51, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a polymerase chain reaction.

53. A method according to claim 51, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a hybridization assay.

54. A diagnostic kit, comprising:

- (a) one or more antibodies according to claim 11; and
- (b) a detection reagent comprising a reporter group.

55. A kit according to claim 54, wherein the antibodies are immobilized on a solid support.

56. A kit according to claim 54, wherein the detection reagent comprises an anti-immunoglobulin, protein G, protein A or lectin.

57. A kit according to claim 54, wherein the reporter group is selected

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from the group consisting of radioisotopes, fluorescent groups, luminescent groups, enzymes, biotin and dye particles.

58. An oligonucleotide comprising 10 to 40 contiguous nucleotides that hybridize under moderately stringent conditions to a polynucleotide that encodes a colon tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111, 116-119, 123-132, 138-142, 143, 148, 149, 156, 168, 170-182, 184, 189, 191-193, 196, 205, 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279, 282, 291, 293, 294, 298, 300, 302, 303, 310-313, 315, 317, 320, 322, 324, 332-335, 345, 347, 356, 358, 361, 362, 366, 369, 371-378, 380-404, 406, 409-417, 419-423, 425, 427-429, 433-436, 438-441, 443, 446-451, 454, 455, 457-461, 476, 477, 479 and 483 or a complement of any of the foregoing polynucleotides.

59. A oligonucleotide according to claim 58, wherein the oligonucleotide comprises 10-40 contiguous nucleotides recited in any one of SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111, 116-119, 123-132, 138-142, 143, 148, 149, 156, 168, 170-182, 184, 189, 191-193, 196, 205, 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279, 282, 291, 293, 294, 298, 300, 302, 303, 310-313, 315, 317, 320, 322, 324, 332-335, 345, 347, 356, 358, 361, 362, 366, 369, 371-378, 380-404, 406, 409-417, 419-423, 425, 427-429, 433-436, 438-441, 443, 446-451, 454, 455, 457-461, 476, 477, 479 and 483.

25

60. A diagnostic kit, comprising:

(a) an oligonucleotide according to claim 59; and

(b) a diagnostic reagent for use in a polymerase chain reaction or

hybridization assay.

SEQUENCE LISTING

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DIAGNOSIS OF COLON CANCER AND METHODS FOR THEIR USE

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 tcattccacag caaagtcaat atcttgccaa gcaacattag catatgaaaa gcggttatta 1020
 taggcagcat tagggagagt ttgagtcaca gcaatcgtgt tgggtgtcag gttactctg 1080
 gcaatattcc cgggtgtgta catgttgacg tacatgttgt tgttgtaaac tgctgtacca 1140
 ctaccttgga c 1151

<210> 9
 <211> 604
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(604)
 <223> n = A,T,C or G

<400> 9
 ctgtgcaagg gctttacaaa aactgtgccg ggacttccca tgaggctgga ttgcttgatt 60
 catgttttat gagccccaca atactgaagc tccttttcca gggacttggc ataggcagtc 120
 aattccacat ttgggatagg tcctctctgg aagtgaatgt caggcagtga catccaagtt 180
 tctgcatgca gtgggttaac agccatgttt agggggaaca tgatttaaaa agtacatctc 240

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```

tctccctcct ccccccacatg cacaaggctc acatctcatt atgggtgkcg cccatgtcac 300
attaaagtgt gatacttkgg ttttgaaaac attcaaacag tctctgtgga aatctggaga 360
gaaattggcg gagagctgcc gtgggtgcatt cctcctgtag tgcttcaagn taatgcttca 420
tcctttntta ataacttttg atagacaggg gctagtgcga cagacctctg ggaagccctg 480
gaaaacgctg atgcttggtt gaagatctca agcgcagagt ctgcaagttc atccctctt 540
tcctgaggtc tgttggtgagg aggtgcaga acattggtga tgacatggac cagccattt 600
gtgg 604

```

<210> 10
 <211> 473
 <212> DNA
 <213> Homo sapien

```

<400> 10
tcgagaagat ccctagttag actttgaacc gtatcctggg cgacccagaa gccctgagag 60
acctgctgaa caaccacatc ttgaagtcag ctatgtgtgc tgaagccatc gttgcggggc 120
tgtctgtgga gaccttggag ggcacgacac tggaggtggg ctgcagcggg gacatgtca 180
ctatcaacgg gaaggcgatc atctccaata aagacatcct agccaccaac ggggtgatcc 240
actacattga tgagctactc atcccagact cagccaagac actatttgaa ttggctgcag 300
agtctgatgt gtccacagcc attgacctt tcagacaagc cggcctcggc aatcatctct 360
ctggaagtga gcggttgacc ctctgggct cccctgaatt ctgtattcaa agatggaacc 420
cctccaattg atgcccatac aaggaatttg ctccggaacc acataattaa aga 473

```

<210> 11
 <211> 411
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(411)
 <223> n = A,T,C or G

```

<400> 11
tcctcattgg tcggggccaa aagcgtgtac tggccgttac cttcaagcat cgtgttgagc 60
cctgatgcag ccacagcagc ccgaagggtc tcaaagggtg cctcgatctc aatgatctgc 120
tggatgttgt tgggtatggt ggagatgacc ttatcgatga ggtgcaccac cccgttgggt 180
gcatggtggt cggcttgyar carccgggca cagttcacag ttacaatccc attaggatag 240
tgggtgatct nggatgttg aattctggt catagnaggt gaggggtcat gccctgttt 300
cagctcatca gtcaggactc gcctgccac catatggtaa gcsgragggc atttgagcag 360
ctcaatgttt gacattgctg gaccagggga gttccagcac ttctangang a 411

```

<210> 12
 <211> 560
 <212> DNA
 <213> Homo sapien

```

<400> 12
tacttgccctg gagatwgcyt tykckwtmtg ytcwrawgtc cgtggataga gaaatctctg 60
caggcaagtt gctccagagc atattgcagg acaagcctgt aacgaatagt taaattcacg 120
gcatctggat tcctaattct tttccgaaat ggcaggtgtg agtgccctgta taaaatattc 180
tatgtttacc ttcaacttct tgttctggct atgtggtatc ttgatcctag cattagcaat 240
atgggtacga gtaagcaatg actctcaagc aatttttggg tctgaagatg taggctctag 300
ctcctacggt gctgtggaca tattgattgc tgtaggtgcc atcatcatga ttctgggctt 360
cctgggatgc tgcggtgcta taaaagaaag tcgctgcatg cttctgttgt ttttcatagg 420

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cttgcttctg atcctgctcc tgcaggtggg cgacaggat cctaggagct gttttcaa	480
aat ttaagtctga tcgcattgtg aatgaaactc tctatgaaaa cacaaagctt ttgagcgcca	540
caggggaaag tgaaaaacaa	560

<210> 13
 <211> 150
 <212> DNA
 <213> Homo sapien

<400> 13	
gggcaggctg tcttttttaa atgtctcggc tagctagacc acagatatct tctagacata	60
ttgaacacat ttaagatttg agggatataa gggaaaatga tatgaatgtg tatttttact	120
caaaataaaa gtaactgttt acgttggtga	150

<210> 14
 <211> 403
 <212> DNA
 <213> Homo sapien

<400> 14	
ctgctgcctg tggcgtgtgt gggctggatc ccttgaaggc tgagtttttg agggcagaaa	60
gctagctatg ggtagccagg tgttacaaag gtgctgctcc ttctccaacc cctacttggt	120
ttccctcacc ccaagcctca tgttcatacc agccagtggg ttcagcagaa cgcagacac	180
cttatcacct cctcctcttg gtgagctctg aacaccagct ttggccctc cacagtaagg	240
ctgctacatc aggggcaacc ctggctctat cattttcctt ttttgccaaa aggaccagta	300
gcataagtgga gccctgagca ctaaaaggag gggtcctga agctttccca ctatagtgtg	360
gagttctgtc cctgaggtgg gtacagcagc ctgggttctt ctg	403

<210> 15
 <211> 688
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(688)
 <223> n = A,T,C or G

<400> 15	
caaagcacat ttaatcatt tattttaaaa gggggagtaa agcattttaa ctgccaatcc	60
tatagactag gacttgaaca tcaaaggaaa aatagacaaa gactagatga taaagtcatt	120
caaaagcaca gaagcacatc acatacacca gcaaggtttc caactactgc actgattaac	180
tagatactct caatagcttt tctatagctc gtcctagaaa aaaaaattaa attttcattt	240
tcttacaagt tccaggctta aacaaaggca aaaattacat gcaacaactg atacactcat	300
aagttgcaca tatgtccaa ggtctttatt agataacaat aaatgctagc actttgtcac	360
tgccatcaga ttttccttat agtcttagag tcatgtaaat aaaagttcca taatgaaatt	420
aaagaaaatt aatttttcta atcttagatc agttccatag aaaactatta atttttttaa	480
agtaggcagt agaagggggt tgggtggggg tggaattggg tagtaagtct ggttctaata	540
ttctgagctg cctttggaag gaagttatga ggtagaagat tctactgact ttttagtaagg	600
tggacaatga gagaaaagaa aaagcaggtg cctcatcnnn agatccttnt ggtatttatn	660
tgccangtnc nanntaatnc atanaaag	688

<210> 16
 <211> 408
 <212> DNA

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<213> Homo sapien

<400> 16
 caggatcatca agatgactta caggatgtaa tagggagagc tgctgagatt ggtgttaaaa 60
 agtttatgat tacagggtgga aatctacaag acagtaaaga tgactgcat ttggcacaaa 120
 caaatggat gtttttcagt acagttggat gtcgtcctac aagatgtggt gaatttgaaa 180
 agaataaccc tgatctttac ttaaaggagt tgctaaatct tgctgaaaac aataaagga 240
 aagttgtggc aataggagaa tgcggacttg attttgacct gactgcagtt ttgtcccaaa 300
 gatactcaac tcaaatattt tgaaaaacag tttgaactgt cagaacaaac aaaattacca 360
 atgtttcttc attgtccgaa actcacatgc tgaatttttg gacataat 408

<210> 17

<211> 407

<212> DNA

<213> Homo sapien

<400> 17
 ggtcctgggg aggccctagg ggagcaccgt gatggagagg acagagcagg ggctccagca 60
 ccttctttct ggactggcgt tcacctccct gtcagtgtct tgggctccac gggcaggggt 120
 cagagcactc cctaatttat gtgctatata aatatgtcag atgtacatag agatctattt 180
 tttctaaaac attccctcyc ccaactcctc cccacagagt gctggactgt tccaggccct 240
 ccagtgggct gatgctggga cccttaggat ggggctccca gctcctttct cctgtgaatg 300
 gaggcagaag acctccaata aagtgccttc tgggcttttt ctaacctttg tcttagctac 360
 ctgtgtactg aaatttgggc ctttgatcg aatatgggtc agaggtt 407

<210> 18

<211> 405

<212> DNA

<213> Homo sapien

<400> 18
 tgaagagtca acttgggcct ggaggactga taaagtttgt gattttgagg gcctctaaaa 60
 gtattaaagc agcggcagcc gctgcacgca gacatgaggg ctagggttaa acagtaagat 120
 caagttgttt ggacagaaag gctacagagt gtggctcctg ctcttgtgta agaattacga 180
 ccacgctaac catgcctagg aaggaaagga gttattgttt tgtagaaagg tgctgggggtt 240
 tgagagatca gtcggacacg attggcaggg agagcacgtg tgtttttatg agaattatgc 300
 ccgagatagg taacagatga ggaagaaatt tgggcttgat tgaagtaatg ggggctgtct 360
 gtgaagcttt gcagcagtag agcctaggta atttgcctag cctaa 405

<210> 19

<211> 401

<212> DNA

<213> Homo sapien

<400> 19
 tcctgacatt cctgccttct tatattaata agacaaataa aacaaaatag tgttgaagtg 60
 ttggggcagc gaaaattttt ggggggtggt atggagagat aatgggcgat gtttctcagg 120
 gctgcttcaa gcgggattag gggcggcgtg ggagcctaga gtgggagaga ttaagctgaa 180
 gggaggtcct gtggtaaggg gtgatatcat ggggatgtta gaagaaacat ttgtcgtata 240
 gaatgattgg tgatggcctg gatacggttt tggatgattt gagaagctaa atggaagata 300
 caaggtccga ataaaaggag gagaaaaatg ggtattaaat gtctaagaat tgggaggacc 360
 taggacatct gattagagag tgcctaagga gattcagcat a 401

<210> 20

<211> 331

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<212> DNA

<213> Homo sapien

<400> 20

aggtccagct ctgtctcata cttgactcta aagtcacag cagcaagacg ggcattgtca	60
atctgcagaa cgatgcgggc attgtccaca gtatttgca agatctgagc cctcagggtcc	120
tcgatgatct tgaagtaatg gctccagtct ctgacctggg gtcccttctt ctccaagtgc	180
tcccggattt tgctctccag cctccgggtc tcggctcca ggctcctcac tctgtccagg	240
taagaggcca ggcgggtcgtt caggctttgc atggctcctt tctcggtctg gatgcctccc	300
attcctgcca gaccccggtc tatcccggtg g	331

<210> 21

<211> 346

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(346)

<223> n = A,T,C or G

<400> 21

gggccaccac ttgtaccga tatggacttc cggcttctct gtccaatgga gccacactaa	60
agatctcacc agtcacgtgg tcaatttta gccaacctct tgtgtctccc ctcaagtgaat	120
agcttatgtc cagaccttct ggatccttgg cagtcacatt gccacttta gtgcctatag	180
ctacatcctc actgactttc gcttgggaata cgtgttgga aaattgaggt gcttcattca	240
catctgtcac aataagnctg gaacttggca aaagaacttg cattgtactt cacaccaaac	300
actagaggct caggattttc tgctttgaac acaatgttgg aaacag	346

<210> 22

<211> 360

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(360)

<223> n = A,T,C or G

<400> 22

gaagactccc tctctcggaa gccggatccc gagccgggca ggatggatca ccaccagccg	60
gggactgggc gctaccaggt gcttcttaat gaagaggata actcagaatc atcggctata	120
gagcagccac ctacttcaaa ccagcaccgc gcagattgtg caggctgcgt cttcagcacc	180
agcacttgaa actgactctt cccctccacc atatagtagt attactggtg gaagtaccta	240
caacttcaga tacagaagtt tacggtgagt tttatcccgt gccacctccc tatagcgttg	300
ctacctctct tctacnwtc cgatgaaagc tgagaaggct aaagctgctg caatggcatg	360

<210> 23

<211> 251

<212> DNA

<213> Homo sapien

<400> 23

ggcggagctc cagcagcagc tggaaaagga accttttgag gatggctttg caaatgggga	60
agaaagtact ccaaccagag atgctgtggt caggtatact gcagaaagta aaggagtcgt	120

```

gaagtttggc tggatcaagg gtgtattagt acgttgtatg ttaaaccattt ggggtgtgat 180
gcttttcatt agattgtcat ggattgtggg tcaagctgga ataggcttat cagtccttgt 240
aataatgatg g 251

```

```

<210> 24
<211> 421
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(421)
<223> n = A,T,C or G

```

```

<400> 24
caggtctttc ccaggtgttg actccagctc cagcttcagc tccagctcca ggtcgggctc 60
cagctccagc cgcagcttar gcagcgggag gttctgtgtc ccagttgttt tccaatttca 120
ccggctcccg tggatgamcg ygggacctgy caswgctcct gktycctgc yagsacacca 180
cnytttyccg tggacacrar kggaacckct tggaaattcac agctyatgtt ctttctcara 240
agtttgagaa agaactttct aaagtgaggg aatatgtcca attaattagt gtgtatgaaa 300
agaaactgtt aaacctaaact gtccgaattg acatcatgga raaaggatac catttcttac 360
actgaactgg acttcgagct gatcaaggta gaagtgaagg agatggaaaa actggtcata 420
c 421

```

```

<210> 25
<211> 381
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(381)
<223> n = A,T,C or G

```

```

<400> 25
gaactttttg tttctttatt ttcaatattt gtcttattaa tatttttctt attttataat 60
gcaattacaa caatttagga nacaaaacaa tataaacaaa agaagtgttaa atagtttttt 120
ttaaaaaata gcttgttgct tgcaanaaag tccatataat cttattcccc cccaaatata 180
attttatact ttgcactaaa ccaaaatagc ttatggaaaa ttagtattaa atagctaaac 240
acagaaaacc tacagctata aataacataa aatacagttt aactttaatg ngatgcttaa 300
acaaagcaaa ctatgatgca atatgaatca acttcattaa ttggacaagt ccagnggagg 360
cacaaattag ataagcacta a 381

```

```

<210> 26
<211> 401
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(401)
<223> n = A,T,C or G

```

```

<400> 26
ggaaaaggga ctggcctctc tgaagagtga gatgagggaa gtggaaggag agctggaaaag 60

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```

gaaggagctg gagtttgaca cgaatatgga tgcagtacag atggtgatta cagaagccca 120
gaaggttgat accagaagcc aagaacgctg gggttacaat ccaagacaca ctcaacacat 180
tagacgggct cctgcattct gatggaccaa ccttttcang tggtaagatt gaagangggg 240
cctgggctta cctgggaagc aaaaactttt cccganccaa ggaacccagg attcaaccan 300
gcnacttgcn ggccaaggaa ggcanaactn ggaanaaaag gccccttaag caaaagggnc 360
accttcattt gctnggaaan cagcctttan ttggaatctt g 401

```

<210> 27
 <211> 383
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(383)
 <223> n = A,T,C or G

```

<400> 27
aattgcaact ggacttttat tgggcagtta cnacaacnaa tgttttcana aaaatatttg 60
gaaaaaatat accacttcat agctaagtct tacagagaan aggatttgct aataaaactt 120
aagttttgaa aattaagatg cnggtanagc ttctgaacta atgcccacag ctccaaggaa 180
nacatgtcct atttagttat tcaaatacca gttgagggca ttgtgattaa gcaacaata 240
tatttggtan aactttgntt ttaaattact gntncttgac attacttata aaggagnctc 300
taactttcga tttctaaaac tatgtaatac aaaagtatan ntttcccat tttgataaaa 360
gggccnanga tactgantag gaa 383

```

<210> 28
 <211> 401
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(401)
 <223> n = A,T,C or G

```

<400> 28
ggtcgcggtt cccctggctc acagtctgcc attatttgca tttttaaatg aagaaaagtt 60
taacgtggat ggatggacag ttacaatcc agtggagaa tacaggaggc agggcttgcc 120
caatcaccat tggagaataa cttttattaa taagtgtctat gagctctgag acacttacc 180
tgctcttttg gtgggtccgt atcgtgcctc anatgatgac ctccggagag ttgcaacttt 240
taggtcccga aatcgaattc cagtgtgtc atggattcat ccagaaaata agacgggtcat 300
tgtgcgttgc agtcagcctc ttgtcggtat gagtgggaaa cgaaataaag atgatgagaa 360
atatctcgat gttatcaggg agactaataa acaaatttct a 401

```

<210> 29
 <211> 401
 <212> DNA
 <213> Homo sapien

```

<400> 29
atatgagttt gccatctcca tggatgccat ttcaatgcct tcagggtaat cattctctcc 60
ccaaagactg cccacggggt catcactcct gtgacgaaat gagggctgga ttgaagatgt 120
tctgctgagc acccccctgg tcactcttgg ggtctcagaa gagccataat catgaccatt 180
ctcagcatct gaataatcag gttctctcca agtgcttggc aagtctctgat tgcctcagc 240

```

actgggatag tctggctccc caaaaaaggg tggagagtta ggttgaatgt cagcgctgg 300
 ataatcaggc tttcccagag agtctgcgta tggattgatt ctaaaacttg tatgttccag 360
 attctttctg gatcctggat ggttcaaatt ggctctgggt c 401

<210> 30
 <211> 401
 <212> DNA
 <213> Homo sapien

<400> 30
 cctgaactat ttattaaaaa catgaccact cttggctatt gaagatgctg cctgtatttg 60
 agagactgcc atacataata tatgacttcc tagggatctg aaatccataa actaagagaa 120
 actgtgtata gttacctga acaggaatcc ttactgatat ttatagaaca gttgatttcc 180
 cccatcccca gtttatggat atgctgcttt aaacttggaa gggggagaca ggaagtttta 240
 attgttctga ctaaaacttag gagttgagct aggagtgcgt tcatggtttc ttcactaaca 300
 gaggaattat gctttgcaact acgtccctcc aagtgaagac agactgtttt agacagactt 360
 tttaaaatgg tgccctacca ttgacacatg cagaaattgg t 401

<210> 31
 <211> 297
 <212> DNA
 <213> Homo sapien

<400> 31
 acctccatta atgccagggtg ttcctcctct gatgccagga atgccaccag ttatgccagg 60
 catgccacct ggattgcac atcagagaaa atacaccag tcattttgcg gtgaaaacat 120
 aatgatgcca atgggtggaa tgatgccacc tggaccagga ataccacctc tgatgcctgg 180
 aatgccacca ggtatgcccc cacctgttcc acgtcctgga attcctccaa tgactcaagc 240
 acaggctgtt tcagcgccag gtattcttaa tagaccacct gcaccaacag caactgt 297

<210> 32
 <211> 401
 <212> DNA
 <213> Homo sapien

<400> 32
 caaacctgga gccaaaaagg acacaaagga ctctcgaccc aaactgcccc agaccctctc 60
 cagaggttgg ggtgaccaac tcattctggac tcagacatat gaagaagctc tatataaatc 120
 caagacaagc aacaaacctt tgatgattat tcatcacttg ggtgagtgc caccagtgca 180
 agctttaaag aaagtgttg ctgaaaataa agaaatccag aaattggcag agcagtgtgt 240
 cctcctcaat ctggtttatg aaacaactga caaacacctt tctcctgatg gccagtatgt 300
 ccccaggatt atgtttgttg acccatctct gacagttaga gcccgatatc actggaagat 360
 attcaaaccg tctctatgct tacgaacctg cagatacagc t 401

<210> 33
 <211> 401
 <212> DNA
 <213> Homo sapien

<400> 33
 agcagagggga caggaatcat tcggccactg ttcagacggg agccacaccc ttctccaatc 60
 caagcctggc cccagaagat cacaagagc caaagaaact ggcaggtgtc cagcgctcc 120
 aggccagtga gttggtgtc acttactttt tctgtgggga agaaattcca taccggagga 180
 tgctgaaggc tcagagcttg accctgggcc actttaaaga gcagctcagc aaaaaggga 240
 attataggtta ttacttcaaa aaagcaagcg atgagtttgc ctgtggagcg gtgtttgagg 300

agatctggga ggatgagacg gtgctccga tgtatgaagg ccggattctg ggcaaagtgg 360
agcggatcga ttgagccctg gggctctggct ttggtgaact g 401

<210> 34
<211> 401
<212> DNA
<213> Homo sapien

<400> 34
aacaatggct atgaaggcat tgctggtgca atcgacccca atgtgccaga agatgaaaca 60
ctcattcaac aaataaagga catggtgacc caggcatctc tgtatctgtt tgaagctaca 120
ggaaagcga tttatttcaa aaatggtgcc attttgattc ctgaaacatg gaagacaaag 180
gctgactatg tgagaccaa acttgagacc tacaaaaatg ctgatgttct ggttgcttga 240
gtctactcct ccaggtaatg atgaacccta cactgagcag atggggcaac tgtggagaga 300
aggggtgaaa ggatcccacc tcaactctga tttcattgca ggaaaaaagt tagcttgaat 360
atggaccaca aggtaagggc atttgtccat gaatggggct c 401

<210> 35
<211> 401
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(401)
<223> n = A,T,C or G

<400> 35
catttcttcc tactagactg ccccttgat ccactggcag aaatgatggc accaccttgt 60
cttcaggtgg tgctccttca ttattccaag gatgcagcat ctctatggtg ccaggatagg 120
gggtaaaagcc tttggcgccc tttccgcaat ggcacatcag cagtaaaagt ggtaccaata 180
gcangaacag aaagggcaaa atcatgancg caattgctgc ggggtccaag cccacatagg 240
aatcatgctg ngcttccctg canccgctgc catgcaagac actnacaaac tngnantgta 300
aggacctgct tttcaggaca actaaaaccc tgattgnctg aaatcaggaa ctgaatttca 360
cttctcccaa gctttttctc actttggtgc aacancacac t 401

<210> 36
<211> 401
<212> DNA
<213> Homo sapien

<400> 36
cctgctagaa tcaatgccgc tgtgctttcg tggaaatgac agttccttgt tttttttgtt 60
tctgtttttg ttttacatta gtcattggac cacagccatt caggaactac cccctgcccc 120
acaaagaaat gaacagttgt agggagaccc agcagcacct ttcctccaca caccttcatt 180
ttgaagtctg ggtttttgtg ttaagttaat ctgtacattc tgtttgccat tgttacttgt 240
actatacatc tgtatatagt gtacggcaaa agagtattaa tccactatct ctagtgttgg 300
actttaaatc agtacagtac ctgtacctgc acggtcaccc gctccgtgtg tcgccctata 360
ttgagggctc aagctttccc ttgttttttg aaaggggttt a 401

<210> 37
<211> 401
<212> DNA
<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(401)

<223> n = A,T,C or G

<400> 37

```

cnnctntgna atggantnnt tgnctaaaaan ganttgatga tgatgaanat ccctangang      60
antaagcatg gancntgatc ntttncntng cactccttta cgacacggaa acangnatca      120
ncatgatggt accaganacc ttatcaccna cgcgcacnga nctgactnat tccaaagagt      180
tgngggttacg gncatccggt cattgtctgt gccattgct gcagggctga tnctactggt      240
gcttattatg ntggccctga ggatgctcca caatgaatat aagcatgctg catgatcagc      300
ggcaacanat gctctgccgt ttgcactaca tctttcacgg acacnatntc gaanacgggc      360
acnttgcana gttagacttg gaatgcatgg ngccggnan n                             401

```

<210> 38

<211> 401

<212> DNA

<213> Homo sapien

<400> 38

```

aattggctca ctctctcaag gcaagcactg tctcaaggca gtctcaaggc agagatgaca      60
cagcaaaaaa cagaggggga gaaaaaagtc tattattggc ttgtgattta caaaagccaa      120
agtccttttag ataaaaggcc aggagtcgta ccaacataga taccaaatcc aggagaacac      180
agaccagcga taagagggac gcttccccat gaccagacc agcctaaagc ccctgtgggg      240
gcagccagtg gggagctgtc agaccttgga catggtggtc ttgagaatg ggtctgccct      300
tctctccctg accagttggg atagacacct gactggaatc cttgacactg gcaggtgttt      360
ctatgaacag agaggactgt gcctgtcttc ctgaatccca a                             401

```

<210> 39

<211> 401

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(401)

<223> n = A,T,C or G

<400> 39

```

tctggtangg agcaattcta ttatttggca ttgcatggct gggttgaatt aaaacagggga      60
gtgagaacag gtgagtctag aagtccaact ctgaaaagga ccactgtaca ttgaaacaca      120
cggctgtgtt aaagatgctg ctaatgtcag tctactgggtg cactaaagga tctcttattt      180
tatgtaaaac gttgggaatg acaagatana actgatactc tggttaagtta ccctctgaag      240
ctacttcttg tgaaatacta atgacagcat catcctgcca agcgaaagag gcaggcataa      300
gcaaggacaa attaaaaggg ggtaagagcc ttatcatgat gaggagtctt gttttgacat      360
cttgggaaaa gctgtccata gtgtgaagtc gtcaatttct c                             401

```

<210> 40

<211> 401

<212> DNA

<213> Homo sapien

<400> 40

```

tctggtcacc caactcttgt ggaagagggg aattgagatc gagtactgaa tatctggcag      60
agaggctgga atccttcagc cccagagccc agggaccact ccagtagatg cagagagggg      120

```

```

cctgcccagg ggtcagggca gtgggtatca ctggtgacat caagaatata agggctgggg 180
aggcatcttt gtttctggt gccctcctca aagttgctga cactttgggg acgggaaggg 240
gtagaagtag ggctgctcct tttggagctg gagggaaatag acctggagac agagttgagg 300
cagtcgggct gtccaggttc taagcatcac agcttctgca ctgggctctg aggagattct 360
cagccagagg atcccagcct cctcctccct caaatgtcaa g 401

```

```

<210> 41
<211> 401
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(401)
<223> n = A,T,C or G

```

```

<400> 41
ctggactaaa aatgtccact atggggtgca ctctacagtt tttgaaatgc taggaggcag 60
aaggggcaga gagtaaaaaa catgacctgg tagaaggaag agaggcaaag gaaactaggt 120
ggggaggatc aattagagag gaggcacctg ggatccacct tcttccttan gtcccctcct 180
ccatcagcaa aggagcactt ctctaatacat gccctccaga agactggctg ggagaagggtt 240
taaaaaacaa aaatccagga gtaagagcct taggtcagtt tgaaattgga gacaaactgt 300
ctggcaaagg gtgcganagg gagcttggtc tcangagtcc agcccgctca gcctcggggg 360
gtangtttct gaagtgtgcc attggggcct caccttctct g 401

```

```

<210> 42
<211> 310
<212> DNA
<213> Homo sapien

```

```

<400> 42
ggttcgacaa atccccaaaa atggcaaatt aagccctgtg acaaaataag ttattggatc 60
atacagaaat agcccaaatac tggaaatttt gaattaaaat tgtaatcctg taaaacaagt 120
tttggggtga atggatttct ttaataccaa taatattttt aattcccacc acagatggat 180
ttgctgaata tgctaattgt gtgaatgaga aaacaatttt ggggtaggta taccacaag 240
taatctgatg acaaaataaa ccacagactg atgtcaaatt gacaaaaaac tgaaaatatg 300
ctgtgagaaa 310

```

```

<210> 43
<211> 401
<212> DNA
<213> Homo sapien

```

```

<400> 43
aggtcactta cacttgtgac cagtgtgggg cagagacctt ccagccgatc cagtctccca 60
ctttcatgcc tctgatcatg tgcccaagcc aggagtgcc aaccaaccgc tcaggagggc 120
ggctgtatct gcagacacgg ggctccagat tcatcaaatt ccaggagatg aagatgcaag 180
aaatagtaga tcagggtgct gtgggaaata tcctcgtag tatcacgggtg ctggtagaag 240
gagagaacac aaggattgcc cagcctggag accacgtcag cgtcactggt attttcttgc 300
caatcctgag cactgggttc cgacaggtgg tacagggttt actctcagaa acctacctgg 360
aagcccatcg gattgtgaag atgaacaaga gtgaggatga t 401

```

```

<210> 44
<211> 401
<212> DNA

```

<213> Homo sapien

<400> 44

atccctgtaa	gtctattaaa	tgtaaataat	acatacttta	caacttctct	tagtcggccc	60
ttggcagatt	aaatctttgc	aaaattccat	atgtgctatt	gaaaaatgaa	ataaaacctc	120
agatgtctga	attcttattt	caaatacagt	tatataatta	ttttaaatta	caatatacaa	180
tttctgttaa	atacaactgt	taagggattc	tgagaacaat	tataagatta	taataatata	240
tacaaactaa	cttctgaaat	gacatgggtt	gtttccttcc	cacctctcta	ccctctcaaa	300
gagtttttgc	atttgctgtt	cctgggttga	aaaggcaaaa	gaaaatctaa	aaatagtctg	360
tgtgtgtcca	cgacatgctc	gtcctttga	gaatctcaaa	c		401

<210> 45

<211> 401

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(401)

<223> n = A,T,C or G

<400> 45

gtgcctgctg	cctggcagcc	tggccctgcc	gctgcctcag	gaggcgggag	gcatgagtga	60
gctacagtgg	gaacaggctc	aggactatct	caagagattt	tatctctatg	actcagaaac	120
aaaaaatgcc	aacagtttag	aagccaaact	caaggagatg	caaaaaattc	tttggcctac	180
ctatactgga	atggtaaact	cccgcgtcat	anaaataatg	caanaagccc	agatgtggag	240
tgccagatgt	tgcagaatac	tcactatttc	caaatagccc	aaaatggact	tccaaagtgg	300
tcacctacag	gacgtatca	tatactcgag	acttaccgca	tattacagtg	gatcgattag	360
tgtcaaaggc	tttaaactg	tggggcaaag	agatccccct	g		401

<210> 46

<211> 401

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(401)

<223> n = A,T,C or G

<400> 46

gtcagaattg	tctttctgaa	aggaagcact	cggaatcctt	ccgaactttc	caagtccatc	60
catgattcan	agatactgcc	ttctctctct	ctgggatttt	atgtgtttct	gatagtgaat	120
tggtgatgta	tttgctactt	tgcttctttt	ctctttcaag	acttgatcat	tttatatgct	180
gnttgagaaa	aaaaagaact	tttggtagca	aggagggttt	aagaaatgat	tttggatttt	240
ctgctgcgga	atttctcggc	acctacctgt	agtatggggc	acttggtttg	gttcagaggt	300
aagaagggtg	aagaatgagc	tgtacttggt	taagcagttg	aaaccttttt	tgagcaggat	360
ctgtaaaagc	ataattgaat	ttgtttcacc	cccgtggatt	c		401

<210> 47

<211> 401

<212> DNA

<213> Homo sapien

<400> 47


```

ggctctgcagc aatgcacttc aaccatacat actgcttcca ctagctaata ccaaattgcag 60
gttctcagat ccagacaaat ggaggaaaag aacatttatg cttccgtttc agaaagccaa 120
gtcgtagttt tgccccttcc tttctctaaa gtttattccc aaaaacaggt agcattcctg 180
attgggcaga gaagaggata ttttcagccc acatctgctg cagggtatgtc attttctccc 240
atcttctactg tgactagtaa agatctcacc acttctcttt ggaatttcca actttgcttg 300
tgattgaatg tcaattcgtg aatttgattt atgtcagatc acttggcatt gctcttccat 360
atgcatcaag ttgccaggca ctaaacccaa tgttcatgaa c 401

```

```

<210> 48
<211> 430
<212> DNA
<213> Homo sapien

```

```

<400> 48
acataacttg taaacttttt ctgcttgggg gctgtaacag acagaagagt aaagactaca 60
aggattttct gaagatgctt caatgaaaat catcatttcc tctttagtca tcccaagtct 120
tggtttgaaa aacttgggca tggacttata cagacctga accaccactg acttatcatt 180
gggtggcaga ccttgaaacc aagctctctg tgttacttct gaaagtgcac caattctgat 240
ttggctaaga acagaagaca aatactggga tcgtgattct gtgttatact ctagccacag 300
catagcagct tctcgaacgg tttcttcctt ttctacattt aaattgtcac tactgagaat 360
atctatcagt aggtcatgtg acagacctgc cccggggccg gcccgctcga tgcttgccga 420
atatcatggt 430

```

```

<210> 49
<211> 57
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1) ... (57)
<223> n = A,T,C or G

```

```

<400> 49
ggattaaca atatcangca ctcattcttc cctctttatg aaanggatna attttta 57

```

```

<210> 50
<211> 327
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1) ... (327)
<223> n = A,T,C or G

```

```

<400> 50
gatggnggtt tccacaagan tnaangtnen tattaantan nncttgtaga nccacttnna 60
ttaattgnnn tatgnntgnc cttctgggtg ntgtngaagc ttcatatnnt ntttggacat 120
cattacacgt cttagctctt tnaagnacaa ctttaatgct atatgaattt tgccattttt 180
gctaacactg gtatgctcen ngcatccacc atnccactng gaattattta ttncnttcat 240
attaatnttt tgtttaccaa atctnacttg acccgaacga aactttctgn gtattttang 300
gccccnccat tcttactttt caagcct 327

```

```

<210> 51

```

<211> 236

<212> DNA

<213> Homo sapien

<400> 51

cgtctcgaag aagcgcgtgca ggccgatgat ggactgcacg tctgccttgt cctcagttaa	60
cttgttgaat tgcttgaaca tgcggccac atcctgggca aactcctgtg gggagctgta	120
gggaggtgac aacttctcct ggaggcgggc acggatcagg gtcagatcca gggtgccacc	180
gggctggtcc agggagaagg tggagtcgta gccagacctg cccgggcggc cgctcg	236

<210> 52

<211> 291

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(291)

<223> n = A,T,C or G

<400> 52

ctcacatcct gggtcgggct gtagagctgc accatgggtgc tgagcgcccc ctccagctcc	60
ttgtagatgt aaaggacggc gaaggagctg tagtctgtgt ccacgatgcg cacgtccagg	120
tagcccaagg cggggactct gaagtgtgcc ctccggagccc accttcangt actcgggcat	180
ccacctgggtt acagccnttc gncctcgga actccatntg gactttacag gccgccctcc	240
tctgtgggcc tgatggnoct tgcaggacat nggaacacgg gagtcnctt t	291

<210> 53

<211> 95

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(95)

<223> n = A,T,C or G

<400> 53

gtctgtgcag tttctgacac ttgttgttga acatggntaa atacaatggg tatcgctgan	60
cactaagtgtg tanaanttaa caaatgtgct gnttg	95

<210> 54

<211> 66

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(66)

<223> n = A,T,C or G

<400> 54

cctnaatnat ntnaatggta tcaatnnccc tgaangangg gancggngga agccggnttt	60
gtccgg	66

<210> 55
 <211> 265
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(265)
 <223> n = A,T,C or G

<400> 55
 atctttcttc tcagtgccctt ggcctgttg agtctatctg gtaacactgg agctgactcc 60
 ctgggaagag aggccaaatg ttacaatgaa cttaatggat gcaccaagat atatgaccct 120
 gtctgtggga ctgatggaaa tacttatccc aatgaatgcc gtgttatgtt tttgaaaatc 180
 ggaaacgcca gacttctatc ctcatcaca aatctgggcc ttactgaaaa ccaggggttt 240
 naaaatccca ttctnggtcnc cggcg 265

<210> 56
 <211> 420
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(420)
 <223> n = A,T,C or G

<400> 56
 gagcggccgc ccgggcaggt cctcgcggtg acctgatggg atttcaaaac cttggttctc 60
 agcaaggccc agatttttga atgangatag aagtctggcg tttccgattt tcaaaacata 120
 acacgcattc attgggataa gtatttccat cagtcccaca gacngggica tatactctgg 180
 gtgcattccat taagttcctt tgtaacatt tgggcctctc ttccccangg gaattcagct 240
 cccagttggt taccaanatt naactccacc ggggccaaag gcnccttgaaa aaaaaanaa 300
 ttccctgttt accttccctg ggctttnaagt tctggcgctc aaaagttcaa tttgaaaact 360
 gcaccgcact taccacgtct cttnagaan cctggggaca cctcgycgcg gaccacgcta 420

<210> 57
 <211> 170
 <212> DNA
 <213> Homo sapien

<400> 57
 gaagcggagt tgcagcgctt ggtggccgcc gagcagcaga aggcgcagtt tactgcacag 60
 gtgcattcact tcatggagtt atgttgggat aaatgtgtgg agaagccagg gaatcgcta 120
 gactctcgca ctgaaaattg tctctccaga cctcgggccg gaccacgcta 170

<210> 58
 <211> 193
 <212> DNA
 <213> Homo sapien

<400> 58
 attttcagtg cgagagtcta ggcgattccc tggcttctcc acacatttat cccaacataa 60
 ctcatgaag tgatgcacct gtgcagtaaa ctgcgccttc tgctgctcgg cggccaccag 120
 gcgctgcaac tccgcttcat cggcttcgcc cagctccgcc attgttcgcc acctgcccgg 180

gcggccgctc gaa

193

<210> 59
<211> 229
<212> DNA
<213> Homo sapien

<400> 59
cgcaactctc gagcatttat atacaatagc aaatcatcca gtgtgttgta cagtctataa 60
tactccaaca gtctcccatc tgtattcaat ggcgccaccc aatacagtc tttgtttgga 120
tgctggggag agtaatccct accccaagca ccatatagat aagaaaaccc tctccagttg 180
agctgaacca cagacgggtt gctgatacct gcccgggcgg ccgctcgaa 229

<210> 60
<211> 340
<212> DNA
<213> Homo sapien

<400> 60
tcgagcggcc gcccgggcag gtctctctaaa gatcaaaaca cccctgtcgt ccaccctcct 60
ccactccag ggaagctgtg gtcattggtg tgtggtgaac atcagcaaac cgtctgtggt 120
tcagctcaac tggagagggt tttcttatct atatggtgct tggggtaggg attactctcc 180
ccagcatcca aacaaaggac tgtattgggt ggcgccattg aatacagatg ggaaactgtt 240
ggagtattat aaactggtac aacacactgg atgatttgc attgtatata aatgctcgag 300
aattgcggat cacctatgga cctcggccgc gaccacgctg 340

<210> 61
<211> 179
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)... (179)
<223> n = A,T,C or G

<400> 61
tttttgtgac ggacgnnttg agtacatgtc ccaggatcac atccagcagc tagagtggct 60
gggacaagct ggcgngggcc aagcactgtt gaaacnatag gggcttggn gnactcgggt 120
tnaagtgggt ggtccgantn ttnataacct tgtcngaacc nancatctcg gttgncang 179

<210> 62
<211> 78
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)... (78)
<223> n = A,T,C or G

<400> 62
agggcggttcg taacgggaat gccgaagcgt gggaaaaagg gagcgggtggc nggaagacgg 60
ggatgagctt angacaga 78

<210> 63
 <211> 410
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(410)
 <223> n = A,T,C or G

<400> 63
 cccagtact tggggaggct gaggcagga gaatccttg aacccgngg gtgggaggtt 60
 gcagtgagcc cgagatagca ccattgcact tccancatgg ggtggacaga gtgagactct 120
 atctcaaaaa aaaagaaaag aaaaggaaag agattagatt aagattaagt acctacttcc 180
 tntcccatTT caagtctga aaatagagga tcagaaatgt tgaggaattc tttagatag 240
 aaaggagat gggattttac ttatggggaa agaccgcaa taaagactgn aacttaacca 300
 cattcccaa gtgnaagtg ttaccaaga agtaggaacc cttttggctn ttaccttacc 360
 ttccngaaaa aaacttattn cttaaaatgg aaacccttaa agcccgggca 410

<210> 64
 <211> 199
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(199)
 <223> n = A,T,C or G

<400> 64
 cttgttctca aaaaggTcaa agggagcccg acgaggaata aatagcaatg cccrgaatTC 60
 caactgacct tctacagaaa agtgcttgac tgccaagtgg tcttcccagt cattagtgag 120
 gctcttgtag aattctccat actcctcttg ggngangnca tnagggttn nggcccAaat 180
 aggntgggcc tngttaagt 199

<210> 65
 <211> 125
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(125)
 <223> n = A,T,C or G

<400> 65
 agcggTacag ttctgtcctg gcatcatcat tcattgtagt atggTcaata ggtgccatga 60
 aactcagtag cttgctaagg acatgaaacc gaagtTtct gcctttgctg gcctngtngn 120
 gggta 125

<210> 66
 <211> 204
 <212> DNA
 <213> Homo sapien

<400> 66
 attcagaatt ctggcatcgg tattttctata aagtcacatca gttagagcag gagcaggccc 60
 ggaggggacgc cctgaagcag cgggcggaac agagcatctc tgaagagccc ggctgggagg 120
 aggaggaaga ggagctcatg ggcatttcac ccatatctcc aaaagaggca aagggttcctg 180
 tggacctcgg ccgcgaccac gcta 204

<210> 67
 <211> 383
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(383)
 <223> n = A,T,C or G

<400> 67
 tcagggcctc caggcagcca gttttgcagg anattcagca cctagngtct tctgcctna 60
 cgctcccaag aacctgctcc tgcaggggga acatcagaac tcgtccttga tgcataaatg 120
 gggctggtct ttaggcttga agtccaggtt agggctgcca tcctcattga gaattctccg 180
 ggcagtgtan ccgacgatgg ggtatttggc tttgtacact ttggtgaaaa cctnatccag 240
 ggctccagc tctttggcgg tganaccctg antgtcatgg gtgaggtctg caggatccaa 300
 ggacatcttg gctacccttc tagtggagtc cttccccgctc aaggcattgt aaggggctcc 360
 tcgtccataa aactcctttt cgg 383

<210> 68
 <211> 99
 <212> DNA
 <213> Homo sapien

<400> 68
 tcacatctcc tttttttttt aactttttca aatttttgtg ttaaataгаа ggctaaaggg 60
 ttagatttaa gtttctgcta cattgacctt atttaccta 99

<210> 69
 <211> 37
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(37)
 <223> n = A,T,C or G

<400> 69
 gagaaggacn tacggncctg ntantanang aatctcc 37

<210> 70
 <211> 222
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(222)

<223> n = A,T,C or G

<400> 70

gtgggtcatt	tttgctgtca	ccagcaacgt	tgccacgacg	aacatccttg	acagacacat	60
tcttgacatt	gaagcccaca	ttgtcccag	gaagagcttc	actcaaagct	tcatggcgca	120
tttcgacaga	ttttacttcc	gttgtaacgt	tgactggagc	aaaggtgacc	accataccgg	180
gtttgagaac	accantcac	ctgccccggg	cggccgctcg	aa		222

<210> 71

<211> 428

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(428)

<223> n = A,T,C or G

<400> 71

caggagtatt	ttgtagaaaa	gccagaagag	cattagtaga	tgtatggaaa	tatacggtag	60
ggcacacgct	gacagtactt	ttcccagcc	acgccgtatt	tcttcttaca	gtggtactcg	120
tcacgagctt	ctcggtaggac	aagcaacatg	gtgaaataaa	ttatgtagaa	ataaggcaga	180
atgtgggttaa	aaccacatgg	gagggaccac	gccaaaggcca	tgatgagatc	acccaagtaa	240
ttgggggtggc	gaacaaaagcc	ccaccatcca	gaaactagaa	naatttttcc	cgttgaaata	300
tgaatggntt	ttaaatgtgc	aagctttgga	tcactgggaa	ttttcccgaa	tgccttttcc	360
tganaattgc	accttnggaa	ganticcttac	cccaagnttc	agaccattat	ttnaaaagcn	420
ttggaact						428

<210> 72

<211> 264

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(264)

<223> n = A,T,C or G

<400> 72

gaataaagag	cttactggaa	tccagcaggg	ttttctgccc	aaggatttgc	aagctgaagc	60
tctctgcaaa	cttgatagga	gagtaaaaag	ccacaataga	gcagtttatg	aagatcttgg	120
aggagattga	cacacttgat	cctgccagaa	aatttcaaag	acagtagatt	gaaaaggaaa	180
ggctttggta	aaaaaagggt	caggcattcc	tagccgantg	tgacacagtg	gagcanaaca	240
tctgcangag	actgancggc	tgca				264

<210> 73

<211> 442

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(442)

<223> n = A,T,C or G

<400> 73

ggcgaatccg	gcgggtatca	gagccatcag	aaccgccacc	atgacggtgg	gcaagagcag	60
caagatgctg	cagcatattg	attacaggat	gaggtgcatc	ctgcaggacg	gccggatctt	120
cattggcacc	ttcaaggctt	ttgacaagca	catgaatttg	atcctctgtg	actgtgatga	180
gttcagaaaag	atcaagccaa	agaacttcaa	acaagcagaa	aggggaagaga	agcgagtcct	240
cgggtctggng	ctgctgccaa	gggagaatct	ggtctcaatg	acngtagaag	gaccttcttc	300
caaagatact	ggnattgctc	gagttccact	tgctggaact	tcccggggcc	caaggatcgc	360
aaggcttctg	gcaaaagaaa	tccanacttn	ggccggggacc	acctaanca	attcacacac	420
tggcggccgt	actagtggat	cc				442

<210> 74

<211> 337

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(337)

<223> n = A,T,C or G

<400> 74

ggtagcagcg	tctccagagc	ctgatctggg	gtcccagata	cccaggcagc	agcagccctg	60
gaggtaaagg	gcaagctccc	caatgtgagg	ggagacccca	ttcctgggtca	gccaggcttt	120
cagaggagat	agcaggtcga	gggagccaac	gaagaagaga	ctgccancag	gggaaggact	180
gtcccgccaa	ggacagaact	gattcagggg	ggtcaatgct	cctctagaga	agagccacac	240
agaactgggg	ggtccaggaa	ccatgaanct	tggctgtggt	ctaaggagcc	aggaatctgg	300
acagtgttct	gggtcatacc	aggattctgg	aattgta			337

<210> 75

<211> 588

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(588)

<223> n = A,T,C or G

<400> 75

catgatgagt	tctgagctac	ggaggaaccc	tcatttcctc	aaaagtaatt	tatttttaca	60
gcttctggtt	tcacatgaaa	ttgtttgcgc	tactgagact	gttactacaa	actttttaag	120
acatgaaaag	gcgtaatgaa	aaccatcccg	tccccattcc	tcctcctctc	tgagggactg	180
gaggggaagcc	gtgcttctga	ggaacaactc	taattagtac	acttgtgttt	gtagatttac	240
actttgtatt	atgtattaac	atggcggtgt	tatttttgta	tttttctctg	gttgggagta	300
tgatatgaag	gatcaagatc	ctcaactcac	acatgtagac	aaacattagc	tctttactct	360
ttctcaaccc	cttttatgat	tttaataatt	ctcacttaac	taattttgta	agcctgagat	420
caataagaaa	tgttcaggag	agangaaaga	aaaaaaatat	atgttcccca	tttatattta	480
gagagagacc	cttantcttg	cctgcaaaaa	gtccaccttt	catagtagta	ngggccacat	540
attacattca	gttgctatag	gncagcactg	aactgcatta	cctgggca		588

<210> 76

<211> 196

<212> DNA

<213> Homo sapien

<400> 76

gcgggtatcac	agcctggccc	ccatgtacta	tcggggggcc	caggctgcc	tcgtggtcta	60
tgacatcacc	aacacagata	catttgacg	ggccaagaac	tgggtgaagg	agctacagag	120
gcaggccagc	cccaacatcg	tcattgcact	cgcgggtaac	aaggcagacc	tggacctgcc	180
cgggcggcgc	ctcgaa					196

<210> 77

<211> 458

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (458)

<223> n = A,T,C or G

<400> 77

agtagagatg	gggtttcact	gtgttaacca	ggatggtcct	gatctcctgg	cctcgtgatc	60
tgcccgcctc	ggcctcccaa	agtgttggga	ttacaggcgt	gaaccaccgc	acccggccag	120
aaatgttagt	ttttccctat	tctctctcct	ttttcctatt	atatacttgg	tcaaccagac	180
agccatccta	ccccanaatg	gtaatgcctc	ttcattcctc	atatgagggg	ataaaagaga	240
aaaaagcttt	tggaaaacat	ccacttatct	aatcatccca	aatatgtaat	caaaagtata	300
caactcatgt	gaagaatata	ctggtaaaat	gttantatag	gccaaaggat	cttgaattcc	360
tatatagaaa	gctggtaaat	gcccttttgg	ctggaaccgc	catcttcenn	taattcnccc	420
aaaatgacca	aacacaaagg	gnaagangan	aagccccc			458

<210> 78

<211> 464

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (464)

<223> n = A,T,C or G

<400> 78

tccgcaaatt	tcctgccggc	aaggtoccag	catttgaggg	tgatgatgga	ttctgtgtgt	60
ttgagagcaa	cgccattgcc	tactatgtga	gcaatgagga	gctgcgggga	agtactccag	120
aggcagcagc	ccagggtggtg	cagtgggtga	gctttgctga	ttccgatata	gtgccccag	180
ccagtacctg	ggtgttcccc	accttgggca	tcatgcacca	caacaaacag	gccactgaga	240
atgcaaagga	ggaagtgagg	cgaattctgg	ggctgctgga	tgcttacttg	aagacgagga	300
cttttctggt	gggcgaacga	gtgacattgg	ctgacatcac	agttgtctgc	accctgttgt	360
ggctctataa	gcaggntcta	gaaccttctt	ttcgcangac	cttcggccgg	accacgctta	420
acccaaattc	cacacacttg	cnggccgtac	taanggaatc	ccac		464

<210> 79

<211> 380

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (380)

<223> n = A,T,C or G

<400> 79
 ctgtatgacc agttttttcca tctccttcac ttctaccttg atcagctcga agtccagttc 60
 agtgtaagaa atgggtatcct tctccatgat gtcaattcgg acagttaggt ttaacagttt 120
 cttttcatatc acactaatta attggacata ttccctcact ttanaaagtt ctttctcaaa 180
 cttctganaa aagaacatga actgtgaatt ccaagcggtc ccactctgtc cacgggaaaa 240
 ggtggtgtct ggcagggaaa cagaacactg gcagggtccac ggtcatccac ggagccggtg 300
 aaattgggaa aacaactggg acacagaacc tccgctgcct aagctgcggn tgggagcttg 360
 gaacccgacc tggaactgga 380

<210> 80
 <211> 360
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(360)
 <223> n = A,T,C or G

<400> 80
 tcgagcggcc gcccgggcag gtcctcagag agctgtttgt tncgcttctt caaaaactcc 60
 tattctccac ttctgctaaa ggactggatg acatcaattg tgatagcaat atttgtgggt 120
 gttctgtcan ncancatcgc actcctgaac aaagtagatg ttggattgga tcagtctctt 180
 tccacccaga tgactcctan atgggtgatn atttcaaact catcantcag tacctgcatg 240
 cngngtccgc ctgtgtncct tgtcctgcag gangggcnct actacacttc ttccnagggg 300
 canaacatgg tgtgcngcgg ccatgggctg gcaacantga ttcnctgctg caccanatan 360

<210> 81
 <211> 440
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(440)
 <223> n = A,T,C or G

<400> 81
 acgtggtccg gcgagtctga cctgcagata tgaactcctt gggaaaccta cattctgcct 60
 cagacatact gggggcaa at ggctttaaaa gtctggctca gggagccaag attacagaaa 120
 nccgttgagt cnccatacat ggacactgac aaaggaactg aagatatcca aacaagccct 180
 cctgggtccc ngcctgcata aagatcggga ncggaacggt accngacgtc tgtggtcagg 240
 ggttgtggaa aattggaaaa aaccagtcct gccacattg acaggggaag ctcaacggaa 300
 attgaacaga tngtcttatc accagtctcc cctcctggat cntgtctcgg ctcnngggan 360
 tcagtgatca gtcctttcag gtggaagaag caaagaagat caacaanaag cngatcctct 420
 cacctgntac cagcatatgg 440

<210> 82
 <211> 264
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature

<222> (1)...(264)

<223> n = A,T,C or G

<400> 82

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agcgtggtcg cggccgangt cctgacattc ctgccttctt atattaatta tacnaataaa    60
acaaaatagt gttgaagtgt tggagcggcg aaaatttttg gggggtggtg tggacagaga    120
atgggcgatn ttctcanggc tgcttcaagt gggattgggg cngcgtggga tcatncagtg    180
gganagattn cnctgaccgg antctnttgg tanggatnat cttgtgggga tgtgcaagag    240
ncattcgtct cctgaatgan tggg                                     264

```

<210> 83

<211> 410

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(410)

<223> n = A,T,C or G

<400> 83

```

ancgtggtcg cggccgangt ccacagttgt gggagagcca gccattgtgg gggcagctcc    60
acaggttaaga ctctgttcct gagcagcgca catcatccag gacaatgggt cctgagccct    120
gaccaaaccg ggcatttcct ggggctgaca tggcccagcc acagcccant tgctgcaga    180
cgaaattggc atcattggtg tcccagtant catcacacac ggtgccccag gaacctccgg    240
tatangaact ccactcggcc tcnanacctg tcgcctccat tcncagcct cagggggcaa    300
actgggattc agatccttct gtgggtacag gtggtgatat cctgacaggg caactttctg    360
gcctgagtgt tgactgangc tgggcagacc tgcccgggcg gccgctcgaa    410

```

<210> 84

<211> 320

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(320)

<223> n = A,T,C or G

<400> 84

```

tcgaacggcc gcccgggcag gtctgccccg ggtgtatcca tttgccgccg atctctatca    60
naaggagctg gtaaccctgc nncgacgaan tcctgaanat aatctcaccg ncccagatct    120
ctctgtcgca atggagatgt cgtcacgggt ggcctgac acagggcatt ggactcagag    180
anangtnanc acagtgtnga agcgattgan nnagtccagt tgctggtctt acccgatntt    240
ggaagggaagg aaaacgtgtt angacgtatc tcgatgnant tgaccaaanc tgaangctnc    300
aggggggcatc gcaaaganan                                     320

```

<210> 85

<211> 218

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(218)

<223> n = A,T,C or G

<400> 85

tcgagcggcc gcccgggcag gtctgctgcc cgtgctggtg ccattgcccc atgtgaagtc	60
actgtgccag cccagaacac tgggtctcggg cccgagaaga ctcctttctc caggctntan	120
gtatccaccac taaaatctcc agggggcacca tnganactct ggggtgccgc aatgttgcca	180
atgtctgtcc gcnnattggc tacccaactg ttgcatca	218

<210> 86

<211> 283

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(283)

<223> n = A,T,C or G

<400> 86

tcgacttctt gtgaagggtt tgganaaata tgtatcagtt cgttttattt ggggtattcaa	60
taatatcctt ggtgataatg ctgactccat ggcttctgac cccaaaaatt gaccctgctg	120
ccactgggtt tagccctgag attgattttt gtagccacga ttgtttcctc gtcctctgaa	180
gtnctgggtt tanttccctc tgnngggcat tcccctctgt tgtanttccc tctgtttgan	240
taactaccac ggccaggaaa aacaggggca cgaaggtatg gat	283

<210> 87

<211> 179

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(179)

<223> n = A,T,C or G

<400> 87

agcgtggtcc cggccgatgt ctttctgtgt aagtgcataa cactccacat acttgacatc	60
cttcangtca cgggccagct ntccagcant ctctggagtg ataggctact gtnctgtctn	120
ggcaagtgtc tcaanaatac aggggtctnc tctgagatga ntttcagtcc cgaaccctc	179

<210> 88

<211> 512

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(512)

<223> n = A,T,C or G

<400> 88

tcgagcggcc gcccgggcag gtcctancan agaataacca aatttatgga gagttaacag	60
gggtttaaca ggaangaagt gccttttagta agttctcaag ccagangctg gaggcagcag	120
ctaaatcaga ggacaggatc ctccagtgaat gtgagccatt cgggggtggca tgtcactcca	180
ggaataagca caacttanaa acaaatgatt tcttangata gcacagtgc attggtgcac	240

ttgtgaacct gaggccactg tgtcaaactg tgcactgggt gtgaataggg aganccaaaa	300
attatgtcct actgggtaat gagctttcaa tgggctcgat cctctcacnc tgaaagctct	360
gtagagcagc tcagaaccac aaccactccc aacattgacc cttctggggg tactgtctgt	420
ggcaccacaca ggaaggagct ggagatcccc attaggactg tccaccacaca cttgaagcca	480
caaaactgca cctcggccgc gaccaccgct ta	512

<210> 89

<211> 358

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(358)

<223> n = A,T,C or G

<400> 89

tcgagcgggc cgcccgggca ggtctgccag tcccacatccc agacattctt tgcattctaag	60
ctgangtctg aactgagtgg ggtgggctgg tgtttccatc ctcacaactc cagtggagccg	120
ggtgtggccg tggcctgcgt ctctctggcg gttagtgatg ttggcatcat ccaccttttt	180
caaaacaaaa gcaactggact gaagaanaat cccnccctgt ntccaccacg tccatggttt	240
ttaataaaaag ggttatnnaa gttgancaag ncatcaccac acacaancct aagaacnttt	300
ttcatcnntc cccaaaacaa acccncaccc tgggaactcc gggcggaac cagccta	358

<210> 90

<211> 250

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(250)

<223> n = A,T,C or G

<400> 90

cgagcggccg cccgggcagg tctggatggg gagacggact ggaactgcgg cttcccgtgg	60
cctgcacgca caaggctccc caggccgcgc gaccttcttc agattcgatc gtatgtgtac	120
gcacnaagag ccaaatattg acattcacaa cttcgtggga atnttacccc anaagactgc	180
gacccccga tcaggcgana gcctgagcat agaagaacac cgctgtgggc ttggcactgt	240
gggncccatc	250

<210> 91

<211> 133

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(133)

<223> n = A,T,C or G

<400> 91

tcgagcggcc gnccgggcag gtcccgggtg gttgtttgcc gaaatgggca agttcntnaa	60
ncctgggaag gtgggtgcntg tncctggctg acgctactcc ggacgcnaag ctgtcntcgt	120
gangancatt gat	133

<210> 92
 <211> 232
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (232)
 <223> n = A,T,C or G

<400> 92
 agcgtggctc cggccgangt ctgtcacttt gcgggggtag cggccaattc cagccaccag 60
 agcatggctg tagggcgcat ctgaggtgcc atcatcaatg ttcttcacga tgacaagctt 120
 tgcgtccgga gtagcgtcca gccaggacaa gcaccacctt cccacgtntt cangaactng 180
 cccatttcgg cataaccacc cgggacctgc ccgggcggnc gctcgaaaag cc 232

<210> 93
 <211> 480
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (480)
 <223> n = A,T,C or G

<400> 93
 agcgtgggtc gggccgang tctgtangct caccggccag agaagaccac tgtgagcatt 60
 ttgccgtata tcttgccttg ccatttgttc acttttttaa ctaaaatagg aacatccgac 120
 acacaccgtt tgcacgtct tctcccttga tattttaagc attttcccat gtcgtgagtt 180
 tctcagaaac atgtttttaa caattgtact atttagtcat ngtcatttta ctataattta 240
 tctgaccatt tccctactgt taaaatactt aagacggttt ctgatttttc cactatttaa 300
 ataatgctgt gatgaatct tttaaaatct tctgatttct tacttttttc ccccttagat 360
 gcctggaagt ggtattttga ggtgaaagag tttgttcatt ttgaanatat ttctgtctct 420
 ctctcgacct gatgtgtana cgctcacttc cagttagcag aaccacctta gtttgtgtct 480

<210> 94
 <211> 472
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (472)
 <223> n = A,T,C or G

<400> 94
 tcgagcggnc gcccgggcag ggtctgatgt cantcacaac ttgaagggat gccaatgatg 60
 taccaatccn atgtgaaatc tctcctctta tctcctatgc tgganaaggg attacaaagt 120
 tatgtggcng ataannaatt ccatgcacct ctantcatcg atgagaatgg agttcatgan 180
 ctggtgaacn atggtatctg aaccgcatac cangttttgt ttgccacgat angantagct 240
 tttatttttg atagaccaac tgtgaacctt ccacacgtct tggacnactg anntctaact 300
 atccncaggg ttttattttg cttgttgaaac tcttncagct nttgcaaact tcccaagatc 360
 canatgactg antttcagat agcattttta tgattccan ctcatgaag gtcttatnta 420

tntcntttttt tccaagccaa ggagaccatt ggacctcggc cgcgaccacc tn

472

<210> 95
 <211> 309
 <212> DNA
 <213> Homo sapien
 <220>
 <221> misc_feature
 <222> (1)...(309)
 <223> n = A,T,C or G

<400> 95
 tcgagcggcc gcccgggcag agtgtcgagc cagcgctcgcc gcgatgggtg tgttgagagag 60
 cgagcagttc ctgacggaac tgaccagact tttccanaag tgccggacgt cgggcancgt 120
 ctatatacacc ttgaagaant atgacggtcg aaccaaacc attccaaaga aangtactgt 180
 gganggcttt gancccgag acaacnagt tctgttaaga actaccgatn ggaaanaana 240
 anacagcac tgtgggtgag ctccnaggga agttaataan tttcgatgg gcttattcna 300
 acctcctta 309

<210> 96
 <211> 371
 <212> DNA
 <213> Homo sapien
 <220>
 <221> misc_feature
 <222> (1)...(371)
 <223> n = A,T,C or G

<400> 96
 tcgagcggcc gcccgggcag gtccaccact cacctactcc cgcctcttat agatttgctt 60
 gttctgggca gttctcagca atggaatcct actgtgtatc tttttgtgac tggttcttta 120
 actcagcatc acattttcaa ggttcacca tgcgtcgacc tggctccgta ctggtgacag 180
 tacttcattt ctctctccct tttgttcaga ccaaggtctc cctctgtccc caaggctaaa 240
 gtgcagttgg tgtgatcatg gctcactgca gcctcaaact cctggactca aacagtcctc 300
 ccactcagc ctcccaaagt gctgatntta taagttgcaa gccctgcacc cagcctgtat 360
 ctccagttg t 371

<210> 97
 <211> 430
 <212> DNA
 <213> Homo sapien
 <220>
 <221> misc_feature
 <222> (1)...(430)
 <223> n = A,T,C or G

<400> 97
 teganccggc gcccgggcag gttnttttn tttnttttt nnnngntagt atttaaagan 60
 atttattaaa tcactttatc accaaaatgg aaacatnttc caactagaaa catgcnacca 120
 tcactttccc cagtccagtc ncaangtcca atatttttct tgcctctgca gataaaaagt 180
 tcnnttttt ataccactc ttactcccc ccaaaatntt aattcngtcc tncctaaaa 240
 ttnncggg taacaantta ccaaaatggc naaccaatta ttttaanaa agttgcncn 300

ttnaaaangg aaactttntg gcaanttanc ctcttttccc tccccacccc ccantttaag	360
gggaaaacaa tggcactttg ctcttgcttn aaccctaaat tgtcttccaa aaactattaa	420
aatgttnaa	430

<210> 98
 <211> 307
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(307)
 <223> n = A,T,C or G

<400> 98	
tcnaacggcc gccnngcnn gtctngcngc acctgtgcct canccgtcga tacctggctg	60
attgggacan ggaanacaat ntgggtttca gggaggccac anatttggag aaacggatga	120
attctccttt attccgaant cagctccttg gtctccgtag anggtgatct tgaaattctc	180
ctgttttgaa aactttcttg aanaaacctt acctgctggt tgtatttggg tccccactcg	240
gacaagtact cgttatccnn ggtactctta atgtgcccac gtnaactccc cgggntggca	300
actggaa	307

<210> 99
 <211> 207
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(207)
 <223> n = A,T,C or G

<400> 99	
gtccnnggacc gatgttgcn aaganntttct tgggtccanta gggtcnaaaa aatgataanc	60
naggntnanc acgtgaagat ntntatanag tcttantnaa aacncntaga tctgnatgac	120
gataantcga anacnggggg aggggntgag gngaggtggn gtganggaag anntgttgat	180
aaaagannna gntgataaga anngagc	207

<210> 100
 <211> 200
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(200)
 <223> n = A,T,C or G

<400> 100	
acntnnacta gaantaacag ncntttctang aacactacca tctgtnttca catgaaatgc	60
cacacacata naaactccaa catcaatttc attgcacaga ctgactgtaa ttaattttgt	120
cacaggaatc tatggactga atctaatgcn nccccaaatg ttgttngttt gcaatntcaa	180
acatnnttat tccancagat	200

<210> 101

<211> 51
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(51)
 <223> n = A,T,C or G

<400> 101
 tcgagcggcc gcccgggcag gtctgaccag tgganaaatg cccagttatt g 51

<210> 102
 <211> 385
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(385)
 <223> n = A,T,C or G

<400> 102
 aacgtggtcg cggccgaagt ccattggtgct gggattaatc cactgtgacn gtgactctga 60
 gttgagttgt ttttcaatct tctccaagcc tgtggactca tcttccacat ccttgggtag 120
 taggatgaac atgctgaaga tgctnatttt gaaaaggaac tctatgaatc ttacaattga 180
 atactgtcaa tgtttcccca tnacagaacg tggnccccga aggttccatc atctgcactg 240
 ggtttgggtg ttctgtcttg gttgactctt gaaaaggac atttcttttt gttttcttga 300
 attcanggaa attttcttca tccactttgc ccacaaaagt taggcagcat ttaaccccca 360
 anggatatttg ggtctgggtc ctccc 385

<210> 103
 <211> 189
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(189)
 <223> n = A,T,C or G

<400> 103
 agcgtggtcg cggccgaagt ctgcagcctg ggactgaccg ggaagctctg attattttacc 60
 caccacaggt angttgtgtt ctgaatctca agttcacagg ttaaggctac agcatcctca 120
 tcttccacgg ggttggantt gttgctggtg atgaanggtt tggggtggct ctgcataact 180
 gttgatctc 189

<210> 104
 <211> 181
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(181)
 <223> n = A,T,C or G

<400> 104

tcgagcggcc	gcccgggcag	gtccaggtct	ccaccaangc	accaccgtgg	gaagctggta	60
attgatgcc	accttgaagc	cnntggggca	ccatccncca	actggatgct	gcgcttggtt	120
ttgatgggtg	caatggcaca	ttgactcttt	tgggaaccac	ttcaccacgg	tacaacaggc	180
a						181

<210> 105

<211> 327

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(327)

<223> n = A,T,C or G

<400> 105

tcgagcggcc	gcccgggcag	gtcttctgtg	gagtctgcgt	gggcatcgtg	ggcagtgggg	60
ctgccctggc	cgatgctcan	aaccccagcc	tctttgtaaa	gattctcatc	gtgganatct	120
ttggcagcgc	cattggcctc	tttggggtca	tcgtcgcaat	tcttcanacc	tccanaatga	180
anatgggtga	ctanataata	tgtgtgggtg	gggcccgtgc	tcacttttat	ttattgctgg	240
ttttctctgg	acagaactcg	ggcgcaaca	cgcttanccg	aattccaaca	cactggcggg	300
cgttactagt	ggatccgagc	tcggtac				327

<210> 106

<211> 268

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(268)

<223> n = A,T,C or G

<400> 106

agcgtgggtc	cggccgangt	ctggcgtgtg	ccacatcggt	cccacctcgc	tttacaaaac	60
agtccctga	ac	ttnatcta	at	aaaattattg	tacacnacat	120
ttacattaga	aaaaganagc					
tgggtgtang	aaaccggg	cc	tgggtgtccc	tttaagcgaa	ngtggctcca	180
cagttggggc						
atcgctcgtt	cctcnaagca	aaaacgcca	a	tgaacccna	agggggaaaa	240
aggaatgaag						
gaactgnccn	gggangnccg	ctccgaaa				268

<210> 107

<211> 353

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(353)

<223> n = A,T,C or G

<400> 107

tcgagcggcc	gcccgggcag	gtggccaggc	catgttatgg	gatctcaacg	aaggcaaaca	60
cctttacacn	ctagatgggtg	gggacatcat	caacgcctcg	tgcttcagcc	ctaaccgcta	120

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ctggctgtgt gctgccgcag gccccagcat caagatctgg gatttanagg gaaagatcnt 180
tgttnnatgaa ctgaancnta aattatcagt tccannacca ngcaaaaacc acccngtgca 240
ctccctggcc tggctctgctg atgggacctc gggcgcgaa acgctnancc caattccanc 300
acactgggcy gncgttacta ntggatccga actcnggtac caancttggc gtt 353

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<210> 108

<211> 360

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(360)

<223> n = A,T,C or G

<400> 108

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agcgtgggtcg cgccgaagt cctggcctca catgaccctg ctccagcaac ttgaacagga 60
naagcagcag ctacatcctt aagggtccgga aagtttagatg aagatttggga tcttgcatg 120
ncttgctcc cacctatctc tccnaatta taaacagcct ccttggaag cagcagaatt 180
taaaaactct ccnctgccc tnttgaacta cacaccnacc gggaaaacct ttttcanaat 240
ggcacaaaaa tncnaggga tgcatttcca tgaangaana aactgggtta cccaaaatta 300
ttgggttggg gaaatccngg gggggttttn aaaaagggc aanccncaa anaaaaaac 360

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<210> 109

<211> 101

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(101)

<223> n = A,T,C or G

<400> 109

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atcgtggtcn cgccgaagt cctgtgtcct ggatgggccc tgtgcanca atccgttggc 60
gactcctaac taccaaaaa angactctcg gaagaaattt c 101

```

<210> 110

<211> 300

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(300)

<223> n = A,T,C or G

<400> 110

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ccanggaaac ccagagtcac atgagatagg gtggctttcg ggacaggggg tcagangaat 60
ggtacatgga tctcagcccc tgatggacac ggaacagggtg tggtcagaac tcccangatt 120
ctgcatccan gatccagtct ctatagaagt tatggatcat tcttcattt cattcccccc 180
ttcatgaaaa aacttctgaa caagcctttt ttctcacttt ggggccctgt ttggcncaag 240
gtnttnantt ggggaaaaaa aaacaaatcc ntccnttan cctccgtgg ggaatgacct 300

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<210> 111

<211> 366
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (366)
 <223> n = A,T,C or G

<400> 111
 cgagcggcgg cccgggcagg tccttgtgtt gccatctgtt ancattgatt tctggaatgg 60
 aacanccttc tcaaagtttg gtcttgctan tcatgaagtc atgtcagttg cttaagtcac 120
 tgctgtcac ttccttacc agggaatata ctgcataagt ttctgaacac ctgttttcan 180
 tattcactgt tctctcctg cccaaaattg gaagggacct catttaaaaa tcaaatttga 240
 atcctgaaan aaaaacngga aatntttctc ttggaatttg gaatagaatt attcanttga 300
 ataacatgtt ttttccctt gccttgctct tcncanaaac atctggacct cggccgcgac 360
 acctta 366

<210> 112
 <211> 405
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (405)
 <223> n = A,T,C or G

<400> 112
 ctgactncta aactttcta tcnatcaana taactactct ccttccgtct tncagagtgt 60
 tcacaataaa tctgtgaatc tggcatacac agttgctgga aaattgttct tcctccacna 120
 aaagggtcaat tgttcnccnc atgaaanaag ataaattgtt catccatcac tncatgaacca 180
 tccaaaacgc cggcggaatt attnccccgt tattatgggg aacggaattt tnaataaatt 240
 tgggaangaa tggggctttt attgttttgt tttccccctt tcttggcatt gattgggccc 300
 caatgggccc cctcgctcan aanntgcccc ggggcccggc gctccaaaac cgaaattccc 360
 anccacactt ggggggcccgt tactanttgg atccgaactc gggtta 405

<210> 113
 <211> 401
 <212> DNA
 <213> Homo sapien

<400> 113
 ggatagaaga gtatatgggt ttggcaccac ggggtggata ggcaaaacat ttggttgata 60
 aggcgcagat tctgaactaa cttgtaaggc ttgtctggtt ttaggacagg taaaatgggg 120
 gaatggtaag gagagtttat aggttttagg agcccatgct gtagcaggca agtgataaca 180
 ggctttaatc ctttcaaagc atgctgtggg atgagatatt ggcatttgag cggggtaagg 240
 gtgattaggt tttaatgaga tggtaagggg tgcgatgacc ggtccgcaa ggaagggaag 300
 tagaggatc ttatacttgt ggggttaagg tgggggggat ataagaggga ggacgcaaaa 360
 ggaggctttg gattaggaat aaggggcggc aatgagatgc a 401

<210> 114
 <211> 401
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(401)
 <223> n = A,T,C or G

<400> 114
 angtcacag gangcangag gccaggctcc gtcccancca gtccatgatg ttgaagagga 60
 ggaagcagca catgggggtg aagaactgac tccacttccc aggactggtg gagctggtca 120
 ccatggctgt ggtggcggg aagacggaca gggtgacttc tgaagacag tgaagactga 180
 aggttttctt ggcttctggg gctcatctgg ctctgattcc ggctccttct ccaggtaag 240
 atccagggtt cagagctact ttcttggggg actactnggg aatcccggtc tcatctgggg 300
 gtngaggggg gacgggnaa gggncatgct tgtgaccag gtttcccacc tcggcccgcg 360
 accacgctaa ggcccgaatt ncagcacact tggcggcccg t 401

<210> 115
 <211> 401
 <212> DNA
 <213> Homo sapien

<400> 115
 atccctgtaa gtctattaaa tgtaaataat acatacttta caactttctt tagtcggccc 60
 ttggcagatt aaatctttgc aaaattccat atgtgctatt gaaaaatgaa ataaaacctc 120
 agatgtctga attcttattt caaatacagt tatataatta ttttaaatta caatatacaa 180
 tttctgttaa atacaactgt taagggtattc tgagaacaat tataagatta taataatata 240
 taaaaactaa cttctgaaat gacatgggtt gtttccttcc caccctccta ccctctcaaa 300
 gagtttttgc atttgctgtt cctgggttgc aaaggcaaaa gaaaatctaa aaatagtctg 360
 tgtgtgtcca cgacatgctc gctcctttga gaatctcaaa c 401

<210> 116
 <211> 301
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(301)
 <223> n = A,T,C or G

<400> 116
 ngatttaatt gnnagcttct ttttaatgga atnnttggct aaaatgaatt gatgattatg 60
 aatatcccta ggaggagtta gcatggannn tgatcatttt cttngnactc ctttangaca 120
 nggaaacagg natcagcatg anggtancan aaaccttatn accnangcgc acganctgac 180
 ttcttccaaa gagttgnggt tccgggcagc ggctcattgc gtgcccattg ctggagggtc 240
 gattctagtg ntgcttatta tgctggccct gaggatgctt ccaanatgaa aataagangc 300
 t 301

<210> 117
 <211> 383
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(383)

<223> n = A,T,C or G

<400> 117

aattgcaact	ggacttttat	tgggcagtta	cnacaacnaa	tgttttcana	aaaatatttg	60
gaaaaaatat	accacttcat	agctaagtct	tacagagaan	aggatttgct	aataaaactt	120
aagttttgaa	aattaagatg	cnggtanagc	ttctgaacta	atgcccacag	ctccaaggaa	180
nacatgtcct	atntagttat	tcaaatacca	gttgagggca	ttgtgattaa	gcaaacaata	240
tatttgttan	aactttgntt	ttaaattact	gntncttgac	attacttata	aaggagnctc	300
taactttcga	tttctaaaac	tatgtaatac	aaaagtatan	ntttcccat	tttgataaaa	360
gggcnanga	tactgantag	gaa				383

<210> 118

<211> 301

<212> DNA

<213> Homo sapien

<400> 118

ctgctagaat	cactgccgct	gtgctttcgt	ggaaatgaca	gttccttggt	ttttttgttt	60
ctgtttttgt	tttacattag	tcattggacc	acagccattc	aggaactacc	ccctgcccc	120
caaagaaatg	aacagttgta	gggagaccca	gcagcacctt	tcctccacac	accttcattt	180
tgaagtccg	gtttttgtgt	taagttaatc	tgtacattct	gtttgccatt	gttacttgta	240
ctatacatct	gtatatagtg	tacggcaaaa	gagtattaat	ccactatctc	tagtgcttga	300
c						301

<210> 119

<211> 401

<212> DNA

<213> Homo sapien

<400> 119

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acgagagcgg	gctgcgtttg	tgtggtgaat	ggggaggaaa	tgtcactgcc	gaagaccaaa	180
aacaagcttc	ttgtataaaa	agactcttac	agaatatgtg	tattgtaatt	tattgatctg	240
gatgcttaag	tgtcatggac	agtaaatgaa	tttgaacttt	atgtttgagg	acatgacatt	300
gggtttgaaa	atataaactg	cttttgagca	gtttaagtca	gggcatttga	gaataaaaata	360
ggaactttct	cttcagtttg	taaaactctc	ttgccctctc	t		401

<210> 120

<211> 301

<212> DNA

<213> Homo sapien

<400> 120

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gaagctctat	ataaatccaa	gacaagcaac	aaacccttga	tgattattca	tcacttgggt	180
gagtgccac	acagtcaagc	tttaaagaaa	gtgtttgctg	aaaataaaga	aatccagaaa	240
ttggcagagc	agtttgcct	cctcaatctg	gtttatgaaa	caactgacaa	acacctttct	300
c						301

<210> 121

<211> 2691

<212> DNA

<213> Homo sapien

<400> 121

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tgccgctgct ggctctcgcc ctggctctgg ccctggggcc cgcgcgacc ctggcgggtc      120
ccgccaaagt gccctaccag ctggtgctgc agcacagcag gctccggggc cgcagcacg      180
gccccaaagt gtgtgctgtg cagaagggtt ttggcactaa taggaagtac ttcaccaact      240
gcaagcagt gtaccaaagg aaaatctgtg gcaaatcaac agtcatcagc tacgagtgtc      300
gtcctggata tgaaaagggt cctgggggaga agggctgtcc agcagcccta ccaactctca      360
acctttacga gaccctggga gtcgttggat ccaccaccac tcagctgtac acggaccgca      420
cggagaagct gaggcctgag atggaggggg ccggcagctt caccatcttc gcccctagca      480
acgaggcctg ggctccttg ccagctgaag tgctggactc cctggtcagc aatgtcaaca      540
ttgagctgct caatgccctc cgctaccata tgggtgggcag gcgagtcctg actgatgagc      600
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ctccaattga tgcccataca aggaatttgc ttcggaacca cataattaaa gaccagctgg     1380
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<210> 122

<211> 683

<212> PRT

<213> Homo sapien

<400> 122

Met Ala Leu Phe Val Arg Leu Leu Ala Leu Ala Leu Ala Leu

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Gly Pro Ala Ala Thr Leu Ala Gly Pro Ala Lys Ser Pro Tyr Gln Leu			
20	25	30	
Val Leu Gln His Ser Arg Leu Arg Gly Arg Gln His Gly Pro Asn Val			
35	40	45	
Cys Ala Val Gln Lys Val Ile Gly Thr Asn Arg Lys Tyr Phe Thr Asn			
50	55	60	
Cys Lys Gln Trp Tyr Gln Arg Lys Ile Cys Gly Lys Ser Thr Val Ile			
65	70	75	80
Ser Tyr Glu Cys Cys Pro Gly Tyr Glu Lys Val Pro Gly Glu Lys Gly			
85	90	95	
Cys Pro Ala Ala Leu Pro Leu Ser Asn Leu Tyr Glu Thr Leu Gly Val			
100	105	110	
Val Gly Ser Thr Thr Thr Gln Leu Tyr Thr Asp Arg Thr Glu Lys Leu			
115	120	125	
Arg Pro Glu Met Glu Gly Pro Gly Ser Phe Thr Ile Phe Ala Pro Ser			
130	135	140	
Asn Glu Ala Trp Ala Ser Leu Pro Ala Glu Val Leu Asp Ser Leu Val			
145	150	155	160
Ser Asn Val Asn Ile Glu Leu Leu Asn Ala Leu Arg Tyr His Met Val			
165	170	175	
Gly Arg Arg Val Leu Thr Asp Glu Leu Lys His Gly Met Thr Leu Thr			
180	185	190	
Ser Met Tyr Gln Asn Ser Asn Ile Gln Ile His His Tyr Pro Asn Gly			
195	200	205	
Ile Val Thr Val Asn Cys Ala Arg Leu Leu Lys Ala Asp His His Ala			
210	215	220	
Thr Asn Gly Val Val His Leu Ile Asp Lys Val Ile Ser Thr Ile Thr			
225	230	235	240
Asn Asn Ile Gln Gln Ile Ile Glu Ile Glu Asp Thr Phe Glu Thr Leu			
245	250	255	
Arg Ala Ala Val Ala Ala Ser Gly Leu Asn Thr Met Leu Glu Gly Asn			
260	265	270	
Gly Gln Tyr Thr Leu Leu Ala Pro Thr Asn Glu Ala Phe Glu Lys Ile			
275	280	285	
Pro Ser Glu Thr Leu Asn Arg Ile Leu Gly Asp Pro Glu Ala Leu Arg			
290	295	300	
Asp Leu Leu Asn Asn His Ile Leu Lys Ser Ala Met Cys Ala Glu Ala			
305	310	315	320
Ile Val Ala Gly Leu Ser Val Glu Thr Leu Glu Gly Thr Thr Leu Glu			
325	330	335	
Val Gly Cys Ser Gly Asp Met Leu Thr Ile Asn Gly Lys Ala Ile Ile			
340	345	350	
Ser Asn Lys Asp Ile Leu Ala Thr Asn Gly Val Ile His Tyr Ile Asp			
355	360	365	
Glu Leu Leu Ile Pro Asp Ser Ala Lys Thr Leu Phe Glu Leu Ala Ala			
370	375	380	
Glu Ser Asp Val Ser Thr Ala Ile Asp Leu Phe Arg Gln Ala Gly Leu			
385	390	395	400
Gly Asn His Leu Ser Gly Ser Glu Arg Leu Thr Leu Leu Ala Pro Leu			
405	410	415	
Asn Ser Val Phe Lys Asp Gly Thr Pro Pro Ile Asp Ala His Thr Arg			
420	425	430	
Asn Leu Leu Arg Asn His Ile Ile Lys Asp Gln Leu Ala Ser Lys Tyr			
435	440	445	

Leu Tyr His Gly Gln Thr Leu Glu Thr Leu Gly Gly Lys Lys Leu Arg
 450 455 460
 Val Phe Val Tyr Arg Asn Ser Leu Cys Ile Glu Asn Ser Cys Ile Ala
 465 470 475 480
 Ala His Asp Lys Arg Gly Arg Tyr Gly Thr Leu Phe Thr Met Asp Arg
 485 490 495
 Val Leu Thr Pro Pro Met Gly Thr Val Met Asp Val Leu Lys Gly Asp
 500 505 510
 Asn Arg Phe Ser Met Leu Val Ala Ala Ile Gln Ser Ala Gly Leu Thr
 515 520 525
 Glu Thr Leu Asn Arg Glu Gly Val Tyr Thr Val Phe Ala Pro Thr Asn
 530 535 540
 Glu Ala Phe Arg Ala Leu Pro Pro Arg Glu Arg Ser Arg Leu Leu Gly
 545 550 555 560
 Asp Ala Lys Glu Leu Ala Asn Ile Leu Lys Tyr His Ile Gly Asp Glu
 565 570 575
 Ile Leu Val Ser Gly Gly Ile Gly Ala Leu Val Arg Leu Lys Ser Leu
 580 585 590
 Gln Gly Asp Lys Leu Glu Val Ser Leu Lys Asn Asn Val Val Ser Val
 595 600 605
 Asn Lys Glu Pro Val Ala Glu Pro Asp Ile Met Ala Thr Asn Gly Val
 610 615 620
 Val His Val Ile Thr Asn Val Leu Gln Pro Pro Ala Asn Arg Pro Gln
 625 630 635 640
 Glu Arg Gly Asp Glu Leu Ala Asp Ser Ala Leu Glu Ile Phe Lys Gln
 645 650 655
 Ala Ser Ala Phe Ser Arg Ala Ser Gln Arg Ser Val Arg Leu Ala Pro
 660 665 670
 Val Tyr Gln Lys Leu Leu Glu Arg Met Lys His
 675 680

<210> 123

<211> 1205

<212> DNA

<213> Homo sapien

<400> 123

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 cgctccaggc cagtgaattg gttgtcactt actttttctg tggggaagaa attccatacc 180
 ggaggatgct gaaggtcag agcttgacct tgggccactt taaagagcag ctacagcaaaa 240
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 gaggttgatt ttcatgattc atgagctggg tactgactga gataagaaaa gcctgaacta 600
 tttattaaaa acatgaccac tcttggtat tgaagatgct gcctgtattt gagagactgc 660
 catacataat atatgacttc ctagggatct gaaatccata aactaagaga aactgtgtat 720
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gttgtgttg	atgggatgat	ctgttgacaga	gggagaggca	gggaaccctg	ctccttcggg	1140
ccccaggttg	atcctgtgac	tgaggctccc	cctcatgtag	cctccccagg	cccagggccc	1200
tgagg						1205

<210> 124

<211> 583

<212> DNA

<213> Homo sapien

<400> 124

ccaagaagca	gtggccttat	tgcatcccaa	accacgcctc	ttgaccaggc	tgccctccctt	60
gtggcagcaa	cggcacagct	aattctactc	acagtgcctt	taagtgaaaa	tggtcgagaa	120
agaggcacca	ggaagcgcgc	ctggcgccctg	gcagtcgcgtg	ggacgggatg	gttctggctg	180
tttgagattc	tcaaaggagc	gagcatgtcg	tggacacaca	cagactattt	ttagattttc	240
ttttgccttt	tgaaccagg	aacagcaaat	gcaaaaactc	tttgagagg	taggaggggtg	300
ggaaggaaac	aaccatgtca	tttcagaagt	tagtttgtat	atattattat	aattctataa	360
ttgttctcag	aatcccttaa	cagttgtatt	taacagaaat	tgtatattgt	aatttaaaat	420
aattatataa	ctgtatttga	aataagaatt	cagacatctg	aggttttatt	tcatttttca	480
atagcacata	tggaattttg	caaagattta	atctgccaa	ggccgactaa	gagaagttgt	540
aaagtatgta	ttatttacat	ttaatagact	tacagggata	agg		583

<210> 125

<211> 783

<212> DNA

<213> Homo sapien

<400> 125

tcaaccatac	atactgcttc	cactagctaa	taccaaatgc	aggttctcag	atccagacaa	60
atggaggaaa	agaacattta	tgcttcgcgt	tcagaaagcc	aagtcgtagt	tttggccctt	120
cctttctcta	aagtttattc	ccaaaaacag	gtagcattcc	tgattgggca	gagaagagga	180
tattttcagc	ccacatctgc	tgagggtatg	tcattttctc	ccatcttcac	tgtgactagt	240
aaagatctca	ccacttctct	ttggaatttc	caactttgct	tgtgattgaa	tgtcacttcg	300
tgaatttgta	ttatgtcaga	tcacttgga	ttgctcttcc	atatgcatca	agttgccagg	360
cactgttgcg	ctgtcggggc	cactggaatc	cacgggggtg	aaacaaattc	aattatgctt	420
ttacagatcc	tgctcaaaaa	aggtttcaac	tgcttaacca	agtagagctc	attcttccac	480
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cagcagaaaa	tccaaaatca	tttctgaaac	ctccttgcta	acaaaagttc	tttttttctc	600
caaacagcat	ataaaatgat	caagtcttga	aagagaaaag	aagcaaagta	gcaaatacat	660
caacaattca	ctatcagaaa	cacataaaat	cccagagaga	gagaaggcag	tatctctgaa	720
tcattggatgg	acttggaag	ttcggaagga	ttccgagtc	ttcctttcag	aaagacaatt	780
ctg						783

<210> 126

<211> 604

<212> DNA

<213> Homo sapien

<400> 126

cctgctagaa	tcactgccgc	tgtgctttcg	tggaaatgac	agttccttgt	tttttttgtt	60
tctgtttttg	ttttacatta	gtcattggac	cacagccatt	caggaactac	cccctgcccc	120
acaaagaaat	gaacagttgt	agggagaccc	agcagcacct	ttcctccaca	caccttcatt	180
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tactatacat	ctgtatatag	tgtacggcaa	aagagtatta	atccactatc	tctagtgcct	300
gactttaaat	cagtacagta	cctgtacctg	cacggtcacc	cgctccgtgt	gtcgccctat	360
attgagggct	caagctttcc	cttgtttttt	gaaaggggtt	tatgtataaa	tatattttat	420

gcctttttat tacaagtctt gtactcaatg acttttgtca tgacattttg ttctacttat	480
actgtaaatt atgcattata aagagttcat ttaaggaaaa ttacttggtg caataattat	540
tgtaattaav agatgtagcc ttatttaaaa ttttatattt ttcaaaaaaa aaaaaaaaaa	600
aaaa	604

<210> 127

<211> 417

<212> DNA

<213> Homo sapien

<400> 127

ctgagcctct gtcaccagag aaggctgagg cccaatggc acacctcaga aacctacacc	60
ccgaggctgg acggctggac tcctgagcac aagctccctc tcgcaccctt tgccagacag	120
tttgtctcca atttcaaaact gacctaaagg tcttactcct ggattttttg tttttaaac	180
ttctcccagc cagtcttcgg gagggcatga ttagagaagt gctcctttgc tgatggagga	240
ggggacctaa ggaagaaggt ggatcccagg tgccctcctc ctaattgatc ctccccacct	300
agtttctctt gcctctcttc ctctaccag gtcattgttt ttactctctg ccccttctgc	360
ctcctagcat ttcaaaaact gtagagtga ccccatagtg gacattttta gtccagg	417

<210> 128

<211> 657

<212> DNA

<213> Homo sapien

<400> 128

ccacactgaa atgcagttaa atgtggaaac ttttctaaat acatattgta gcatctttgg	60
acatcaacgt gtggcctgaa atttttatta ttgttccctc ttctcctcca ttaaaaaaaa	120
aatctccttg tggattttag tcatttacca ttaacacata ttatggctta aaaagggcc	180
tccttccctt ttctgagctg gagttcttca cgctcacctt tgatgcatgg ccttagctgg	240
ttactttgcc ttggtttggg catgaacatt ggggttagtg gcctggcaac ttgaatgcat	300
atggaaagaa caatgccaaag tgatctgaca taatacaaat tccgaagtga cattcaatca	360
caagcaaagt tggaaattcc aaagagaagt ggtgagatct ttactagtca cagtgaagat	420
gggagaaaat gacatacctg cagcagatgt gggctgaaa taccctcttc tctgcccaat	480
caggaatgct acctgttttt gggaataaac ttttagagaa ggaagggcca aaactacgac	540
ttggctttct gaaacggaag cataaatgtt ctttccctcc atttgtctgg atctgagaac	600
ctgcatttgg tattagctag tggaagcagt atgtatggtt gaagtgcatt gctgcag	657

<210> 129

<211> 1220

<212> DNA

<213> Homo sapien

<400> 129

cgcgtgctcg gctcacacca acaaggcaag ccaaaggcgc cctcccccag agggatccct	60
aacgtgccc gcatgtagat tctggactaa cagacaacat acattcaccg ctggtcaccc	120
agatcctcat tcaaaccac tgctggcaca tccctttcct tactttgcc tgtgctacca	180
gccacggaag gagcctctct tgttttttct ataaaatggg taggcaggag aaaagcaggt	240
gccctaagat tgctctaagg ccagcatgt ggttacagt ctctgacttg cagaacctgc	300
caggtgtatg gctacaagtt atcctcgtgc tgatctgtct cattaactaag ttaatggaga	360
agacagaaa gtaaaaatca cgtgtagcaa gaacaactct tatttcacaa actcaggtat	420
gaaacgaaac gcctgtcctt catggaactg ctttttagctc ctgtcttttc aaaatggcag	480
agggagtcc tacacacact ttttccctgg aggccaaagt ctaggggtag aaaggggagg	540
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ctgtccacag tgatacctgc caagatgacc actgaccac atctggctct agtcattggt	660
ctcctcagat ttctggggcc acctgcaagc cccattccat tcctacagat ctctcagcca	720

cctgtaagtc	ctttgtgaag	atgtgggtga	cacaggggga	caggaaaacc	catttctcaa	780
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cctctctgtt	catagaaaca	cctgccagtg	tcaaggattc	cagtcaggtg	tctatcccaa	900
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ctctgttttt	tgctgtgtca	tctctgcctt	gagactgcct	tgagacagtg	cttgccttga	1200
gagagtgagc	caattaacag					1220

<210> 130

<211> 1274

<212> DNA

<213> Homo sapien

<400> 130

ccatattgagt	ttgccatctc	catggatgcc	atttcaatgc	cttcagggta	atcattctct	60
ccccaaagac	tgcccacggg	gtcatcactc	ctgtgacgaa	atgagggctg	gattgaagat	120
gttctgtgta	gcacccccct	ggtcattctt	ggggtctcag	aagagccata	atcatgacca	180
ttctcagcat	ctgaataatc	aggttctctc	caagtgttg	gcaagttctg	attgtcctca	240
gcactgggat	agtctggctc	ccccaaaaag	ggtggagagt	taggttgaat	gtcagcgctt	300
ggataatcag	gctttcccag	agagtctgct	tatggattga	ttctaaaact	tgtatgttcc	360
agattctttc	tggatcctgg	atggttcaaa	ttggctctgg	gtccaggatg	atcagagttg	420
ctctgagctc	cagggtagtc	cggttctaag	gagccaaaat	gatctggatg	tgttctggag	480
cctgcatagt	ttccactgct	gctggagcct	gcaaaatcag	gatttcgttg	agatccaggg	540
tagtctgggt	gtctggatga	tgtctgggtg	taggyatgac	tctgaaattc	actataatct	600
ggctctggta	gagaggtagg	atggtctggg	cttgttctag	aggctgcaga	gtatgcattg	660
cttctgggtg	cagaatagtc	tggattactc	agagatctag	gataatttgg	ttctgccaga	720
gacccaggat	agtctggacg	tgttctggag	gctacagagt	atggattgct	cctggtgccg	780
gggtaatctg	gattgttcag	aggacctgga	acatctggat	aaccttgagt	tttcaaatac	840
ccctgcgtac	ggttctgaga	ccctgaatag	tcagggtaat	ctgggtcttc	ctcagaccag	900
ttattctctg	agtaggcaga	catgttggtg	tggactcttc	accctggagt	ggtaaactgt	960
cccagcattt	gcaattactc	agggatcttt	tttttttcac	ttttttgccc	ttattgttct	1020
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agaacactgg	agtcacgtgt	ccatgggtcc	ttcaggtctg	cttttgatgg	gagctgggat	1140
gcagatgatt	tacggagggt	tataatctgt	gatgctggtc	tgaagtctga	atattccaag	1200
ttgctgactg	caggcagagc	ctcatgtcct	cctggcgctc	ctgttgccgc	tgcttgcgct	1260
ggccctcggg	tcga					1274

<210> 131

<211> 554

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(554)

<223> n = A,T,C or G

<400> 131

ctgtaattct	gccttttcta	ccttcattcc	atccttcttc	tgcccagata	aagkccagca	60
gaaattcctc	ctttctacct	ctctgggact	ctgagacagg	aaatcttcaa	ggaggagttt	120
ttccctcccc	actattctta	ttctcaacct	ccagaggac	caaggctgct	gtacccacct	180
caggacaga	actccacact	atagtgggaa	agcttcaggg	acccctcctt	ttagtgtca	240
gggctcacct	atgctactgg	tccttttggc	aaaaaaggaa	aatgatagag	ccaggggttg	300

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ccctgatgta gcagccttac tgtggagggg ccaaagctgg tgttcagagc tcacccaagg	360
agggaggtga taagggtgtca tgcgttctgc tgaaccact ggntggtagt aacatgaggg	420
ttggggtagg ggaaaccaag taggggttgg agaaggagca gcaccttgt macacctggc	480
tacccatagc tagctttctg cctcaaaaa ctcagccttc aagggatcca gccacacac	540
gccacaggca gcag	554

<210> 132

<211> 787

<212> DNA

<213> Homo sapien

<400> 132	
ctggtcaccc aactcttggtg gaagagggga attgagatcg agtactgaat atctggcaga	60
gaggctggaa tccttcagcc ccagagccca gggaccactc cagtagatgc agagaggggc	120
ctgcccaggg gtcagggcag tgggtatcac tggtagatc aagaatatca gggctgggga	180
ggcatctttg tttcctgggtg cctcctcaa agttgctgac actttgggga cgggaagggg	240
tagaagtagg gctgctcctt ttggagctgg agggaataga cctggagaca gagttgaggg	300
agtcgggctg tccaggttct aagcatcaca gcttctgcac tgggctctga ggagattctc	360
agccagagga tcccagcctc ctctccctc aaatgtcagt ccaagcaaat accaaagcaa	420
cgcctcgatt ttgtggaagt caattagaga tgtggggagc tatcggagac aagcactatt	480
gtaccttttc acctccacac ttgtcacaag cagggactgt ctctcccca ctttgcttgc	540
cacgcctgcc atggcttgag ctggggtgag gagtggctt tatcttctt gggagatcct	600
gactgggtgc gcacttgcta agggcaggaa gtctggaggg ctgcaggaat ggtgccgttg	660
ataaacaggt ggacttataa tcatcatgca ctgcaattgt agaacatagt ctctgcctt	720
ttctcatttg tataattgtc tgggtcaata ttctccaat attgggaggg gctctgcagc	780
cctccag	787

<210> 133

<211> 219

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(219)

<223> n = A,T,C or G

<400> 133	
tactgctcta agttttgtna aatttttcat attttaattt caagcttatt ttggagagat	60
aggaagggtca tttccatgta tgcataataa tcttgcaaag tacaggtagt ttgtctaaga	120
aacattggaa gcagggttaa tgttttgtaa actttgaaat atatggtcta atgtttaagc	180
agaattggaa nagactaata tcggttaaca aataacaac	219

<210> 134

<211> 234

<212> DNA

<213> Homo sapien

<400> 134	
gattttaaaa acatcatgac tttgaactga aaaacataca cgtttagcac acaaatattg	60
taatatgaat gaactccaac tccatttgaa aacatgtgaa tcaaagtaca gttttagaag	120
ttagtaattc acatttaagc aagtttagcg cttgctgaat acagccttg taaaaagag	180
acttagtgca tattttaatg gtacattgtg gttttgtacc atttggttga gttg	234

<210> 135

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<211> 414
 <212> DNA
 <213> Homo sapien

<400> 135
 ctccagcctg gctatatccg gtcccgtat aacctgggca tcagctgcat caacctcggg 60
 gctcaccggg aggctgtgga gcactttctg gaggcctga acatgcagag gaaaagccgg 120
 ggccccggg gtgaaggagg tgccatgtcg gagaacatct ggagcaccct gcgtttggga 180
 ttgtctatgt taggccagag cgatgcctat ggggcagccg acgcgcggga tctgtccacc 240
 ctccctaacta tgtttggcct gcccagtgga cagtgggacg ggctgccctg tgagtgtcca 300
 cctggggatt aaatatgtct tcaacaaggg aggcctggct tctacaatgg tttaggtaaa 360
 ggggcctttg aagtagttct ggccaggctt gcaatacaca caacacaaga gcca 414

<210> 136
 <211> 461
 <212> DNA
 <213> Homo sapien

<400> 136
 gaagtgatta ataggtttat ttgcatatac acagagaaga gtcagcattg ttgggtgaga 60
 agaggcaggc tgtgaggagg taaggcttca gcagaggaag gcaccttgac agacaacacg 120
 agactcctat taaatcagca cagttgcaaa cttcacctgc ctcaagccaa cagctcattg 180
 aactcatatg tcgattgaga atcatttaca aaaccaggag agaacaatg ggaagagcaa 240
 cggctctctca tccctggacc tgacactcaa aacattatgt acaggatgca ggaacaaaat 300
 ctgtctgac agtgccctct cctgctggga aaaacaccca tcacggaaga atttggggat 360
 taaatatgtc ttcaacaagg gaggcctggc ttctacaatg gtttaggtaa aggggccttt 420
 gaagtagttc tggccaggct tgcaatacac acaacacaag a 461

<210> 137
 <211> 269
 <212> DNA
 <213> Homo sapien

<400> 137
 atagcaaatg gacacaaatt acaaatgtgt gtgcgtggga cgaagacatc tttgaaggtc 60
 atgagtttgt tagtttaaca tcatatattt gtaatagtga aacctgtact caaaatataa 120
 gcagcttgaa actggcttta ccaatcttga aatttgacca caagtgtctt atatatgcag 180
 atctaataa aaatccagaa cttggactcc atcgtaaaaa ttatttatgt gtaacattca 240
 aatgtgtgca ttaaatatgc ttccacagt 269

<210> 138
 <211> 452
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(452)
 <223> n = A,T,C or G

<400> 138
 ctccatggga ggcaaaatat agagaattta tgggtgcccc ctcttatgta atcactggac 60
 taatcttccc tggtaactat gcaacatttg gacagaaagg cacacaaaaa agtttaataa 120
 tttcatgtgc caatctggaa aaaaataatt taaatcaaca gaacagacag tacatctaca 180
 caaatgagga aagcagaaaa gatacctcac attcatttat ctcagggttc aaagtggcct 240

caatgctaaa gtaaatgtat taacatttgg aaaatacaag acaatttttt tgtttgtttt 300
 caattttttt agctctatac aatgattaca acataagaca aaaaaaaaaa aaaaacacaa 360
 aaaacaaaac aaaaaaggag ttcaggactt gttatcagtg tccaagtggc taanaactgg 420
 ttcccataac aagcattgaa agttaaggcc cc 452

<210> 139
 <211> 474
 <212> DNA
 <213> Homo sapien

<400> 139
 tgtgcctcat tgaggttaca attgaaacag atgtgagcac ctgagagact ttccctgatt 60
 atattcctcc acaaacact gtaccatatt accttatttt atcttcttga aattcttatt 120
 cattggcttg tttgttgtct ctttgcatta gatatatgta agctccttgg cataaatttg 180
 acattggtag gggactgaca ttctaacctg gcccaggccc taggagagag ataactccac 240
 aaagcagcac atactatctt aggttagcag ggagctaact caccatgtag cagatgaaaa 300
 aaaccaaacc cagcactgtg cataaatacc acttgccaag aagtcaggtc ctcggaacc 360
 gagaatcaac ctgagcacia acgcagggtg ctgggctctg ttccccctta gccaccacct 420
 cagcctctcc cctccccctg cccaagtgcc caagagcttg gctctctgtg cttt 474

<210> 140
 <211> 487
 <212> DNA
 <213> Homo sapien

<400> 140
 ctccctgcc tegtgttctt gagaaacgga ttaatagccc tttatcccc tgcaccctcc 60
 tgcaggggat ggcactttga gccctctgga gccctccctt tgctgagcct tactctctt 120
 agactttctg aatgtacagt gccgttggtt gggatttggg gactggaagg gaccaaggac 180
 actgacccca agctgtcctg cctagcgtcc agcgtcttct aggaggggtg ggtctgctg 240
 tcttggtgtg gttggtttg cctgtttgc tgtgactacc cccccctc cccgaaccga 300
 gggacggctg cctttgtctc tgctcagat gccacctgcc ccgcccagtc tccccatcag 360
 cagcatccag actttcagga agggcagggc cagccagtc agaaccgcat cctcagcag 420
 ggactgataa gccatctctc ggagggcccc ctaataccca agtggagtct ggttcacacc 480
 ctggggg 487

<210> 141
 <211> 248
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(248)
 <223> n = A,T,C or G

<400> 141
 tttaaagatgg ggaaatgagg cctgnaaata gaaaagattt gcctagagtc acacacactg 60
 tcaggtcagg tagagtcaaa atcaggcacc ccgactcaca gactgcttca cattgccatc 120
 agagattgtc ctgcaacaat attatgttta gttctactgc agaagataa ctggatctta 180
 ccccttttgc ctgatctggc cacaacctg tttttcaggc ctttccatta ggctctcttc 240
 agctaatt 248

<210> 142
 <211> 173

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<212> DNA

<213> Homo sapien

<400> 142

tactaagatt gtccaagcct ccctctttaa actttctttc ccttttagagg aatcattact	60
tcgtattaaa agtttctact tccttgtaga atatctacat ccaatgggcc atggcacaaa	120
atttaagtct agaaagaatc ttaaaggctc atcttatagt aaccagaggc agg	173

<210> 143

<211> 511

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(511)

<223> n = A,T,C or G

<400> 143

cctcgtcaga ggggtggttc ctggtnacct gtactccacg gacctcgggtg aagcaaaagc	60
ttcagggcag aggggaatgag gcaaccacgt ggcagccccc ctgggccccg tggctcctgc	120
tctcctattg gacgtagagg caggggagag acttctctat acaaattatc tcatacacaga	180
agggatgac cttgctgctc tgccgtaggg tttttgatgc tgagctatgc tgcacatgac	240
gttaacctaa agaacttggg ctgagctttt aaaaaaggac agcaaacaat tttataatcc	300
ttaaagtgtg atagacgggt acactagtgc aggggtattgg ggaggctctt tgggtgtgga	360
ggctgtcact tgtatttatt gtgactctaa atctttgata gtaaaacaaa tgtaaaaaga	420
aatgtttgcc accagatggg aatagaagtt ccaataagca ggctggaatg ggtggctata	480
cggtgtatca cgaggaagtt ttagactctg a	511

<210> 144

<211> 190

<212> DNA

<213> Homo sapien

<400> 144

cattcttctg tcacatgccg attcagttgt caatcccatt gtctatgctt accggaaccg	60
agacttccgc tacacttttc acaaaattat ctccaggat cttctctgcc aagcagatgt	120
caagagtggg aatggtcagg ctggggtaca gctgctctc ggtgtgggcc tatgatctag	180
gctctgcct	190

<210> 145

<211> 169

<212> DNA

<213> Homo sapien

<400> 145

gatgtgggta tctcctcaga tggccagttt gccctctcag gctcctggga tggaaacctg	60
cgcctctggg atctcacaac gggcaccacc acgaggcgat ttgtgggcca taccaaggat	120
gtgctgagtg tggccttctc ctctgacaac cggcagattg tctctggat	169

<210> 146

<211> 511

<212> DNA

<213> Homo sapien

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<400> 146
 atctagagaa gatttgggaa acacatgata gctatgggta aatacttaac agggcaatca 60
 caggaagat gactagattt cctaaccatcc atgagtgaag tttatagaag tatactctct 120
 gacttgatat aaaggaagat tttaaaaaac atgactgttc aggagtgttc aagtagggtc 180
 agatgaccag tgattgggaa tacttcgtaa gcaggagcaa gtaagatctg agccactgtt 240
 ctatcggtag ggtgtctgtg gtattccttg gtcaaagaag tactctaagc aacttcagtc 300
 tcacgaatta ctatcacctt cgtgggcata catgatgggt accctaaaga ggaagtttca 360
 gaaggcagta atattggatc ctggaatagt cagacaggag ccttcatgca gatacccttt 420
 tcagttctcc atacacccat tcacaagtgg tcacaaaaac acccagtagc tttacttggc 480
 tttacccact taacaatatg ctcaatatga g 511

<210> 147
 <211> 421
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(421)
 <223> n = A,T,C or G

<400> 147
 gaccagtga gttcttctg gctattgtat aatccacagc cacactgtga aagcaaactc 60
 ggccagttag caacacaggg agaactctgc tgaactgacc aaagggtgtc atacttcatg 120
 tcagtgaagaa tttcacctcc atcatgttct aaagagccaa caacagattc tagggcactg 180
 caaaatgctt cagcaattaa ttgaagttct gtttgagtac attcatcatc ttgagaatg 240
 ctttctgggt cgttgtgagt cttgtgtctg atatatgcag ccaaagagt ttcagtacag 300
 ccacctccca acaaagccca tggttccttg agtggttaact gcaggacatg cagtgccgtc 360
 tgacacgtga gcttcagctc atcccangca gtgtcatttc tgttcagag aagccaagct 420
 g 421

<210> 148
 <211> 237
 <212> DNA
 <213> Homo sapien

<400> 148
 acacaccact gttggccttc catctgggtt aagtcaactg tgagtagaaa ccgaagataa 60
 cagttttgta ttcataatgg ccttttcata ctccaagtac ttttgagcac agagcctctt 120
 gcttctgacc tggcacttgg aacacagata tatatatctt ttgttctgtc cctgggaaac 180
 tgatatttgt gtaagacaac caccagatat tttctctaata aaaatcttct aaaatta 237

<210> 149
 <211> 168
 <212> DNA
 <213> Homo sapien

<400> 149
 agagaaagt aaagtgaat aatgtttgaa gacaataagt ggtgggtgtat cttgtttcta 60
 ataagataaa cttttttgtc ttgtcttat cttattaggg agttgtatgt cagtgtataa 120
 aacatactgt gtgttataac aggccttaata aattctttaa aaggagag 168

<210> 150
 <211> 68
 <212> DNA

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<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(68)

<223> n = A,T,C or G

<400> 150

ggtgggggttt ggcagagatg antttaagtg ctgtggccag aagcgggggg ggggttttgt
ggaaattt

60

68

<210> 151

<211> 421

<212> DNA

<213> Homo sapien

<400> 151

aggtgacacg tattcgggat gaaagtataa tagtcattcc ttcaaccctt gcatttatgg
actctggaaa tcgaagatcc acagttagta aagatgttcg tccaaagaca aaaaatagaa
acagctcaac aaagcgagag acaaaaaaac aaaatggcac tgtggctctg cctttgaagt
ctgggctcca gcagagggct gatcttcccc caggagacga gacggcctat gacactctcc
agaactgttg tcagtgccga attttacttc ccttgcccat tctaaatgag caccaggaga
agtgccagag gttagctcac caaaagaaac tccagtgggg ctggtgagat ggctcagcgg
gtaagagcac ccgactgctc ttccgaaggt ccggagtcca aatcccagca accacatggt
g

60

120

180

240

300

360

420

421

<210> 152

<211> 507

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(507)

<223> n = A,T,C or G

<400> 152

gaattcggca cnagctcgtg ccgccagggt nggtccnttt tttgctccgc ctccgccanga
cttcctacag ctatcgccag tcgtcggcca cgtcntcctt cngaggcctg ggcggcggct
ccgtgcgttn tgggcccggg gtcgccttcc nctcncccag cattcacggg ggctccggcg
gccgcggcgt atccgtgtcc tccgcccgct ntgtgtcctc gtccctcctn ggggcctacg
gctngctgct acngcggtt cctgaccgct tccnacgggc tgctggcngg caacgagaag
ctaaccatgc agaacctnaa cnaccgcctg gcctcctacc tgnacaaggt gcgcncctg
taggcggcca acggcnagct agaggtgaag atccnctact gggtagcaga agcaggggccc
tgggcccctgc ccgactacag ccactnctnc acnaccatgc agtacctgcn ggganaagat
tntngggngc caccatngag aactgca

60

120

180

240

300

360

420

480

507

<210> 153

<211> 513

<212> DNA

<213> Homo sapien

<400> 153

gaattcggca cgaggtggct cagatgtcca ctactgggag tatggtcgaa ttgggaattt
tattgtgaaa aagcccatgg tgctgggaca tgaagcttcg ggaacagtcg aaaaagtggg

60

120

atcatcggta aagcacctaa aaccaggtga tcgtgttgcc atcgagcctg gtgctccccg	180
agaaaatgat gaattctgca agatggggccg atacaatctg tcaccttcca tcttcttctg	240
tgccgcgccc cccgatgacg ggaacctctg ccggttctat aagcacaatg cagccttttg	300
ttacaagctt cctgacaatg tcacctttga ggaaggcgcc ctgatcgagc cactttctgt	360
ggggatccat gcctgcagga gaggcggagt taccctggga cacaaggccc ttgtgtgtgg	420
agctgggcca atcgggatgg tcactttgct cgtggccaaa gcaatgggag cagctcaagt	480
agtgggtgact gatctgtctg ctacccgatt gtc	513

<210> 154

<211> 507

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(507)

<223> n = A,T,C or G

<400> 154

ggcacgagct cgtgccgaat tcggcncgag cagacacaat ggtaagaatg gtgcctgtcc	60
tgctgtctct gctgtgtctt ctgggtcctg ctgtcccca ggagaacca gatggtcggt	120
actctctgac ctatatctac actgggctgt ccaagcatgt tgaagacgtc cccgcgtttc	180
agggccttgg ctactcaat gacctccagt tctttagata caacagtaaa gacagggaagt	240
ctcagcccat gggactctgg agacaggtgg aaggaatgga ggattggaag caggacagcc	300
aacttcagaa ggccaggagg gacatcttta tggagaccct gaaagacatc gtggagtatt	360
acaacgacag taacgggtct cacgtattgc aggggaaggtt tggttgtgag atcgagaata	420
acagaagcag cggagcattc tggaaatatt actatgatgg aaaggactac attgaattca	480
acaaagaaat cccagcctgg gtcccct	507

<210> 155

<211> 507

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(507)

<223> n = A,T,C or G

<400> 155

ggcacgagga gacctaaggg ctgagntctg ggaacaggag aaagctctgt tggccctcca	60
gcagcagtgt gctgagcagg cacaggagca tgaggtggag accaggggccc tgcaggacag	120
ctgggtgcag gccaggcag tgctcaagga acgggaccag gagctggaag ctctgcgggc	180
agaaagtcag tcctcccggc atcaggagga ggctgcccgg gcccgggctg aggtctctgca	240
ggaggccctt ggcaaggctc atgctgccct gcaggggaaa gagcagcatc tcctcgagca	300
ggcagaattg agccgcagtc tggaggccag cactgcaacc ctgcaagcct ccctggatgc	360
ctgccaggca cacagtcggc agctggagga ggctctgagg atacaagaag gtgagatcca	420
ggaccaggat ctccgatacc aggaggatgt gcagcagctg cagcaggcac ttgccagag	480
ggatgaagag ctgagacatc agcagga	507

<210> 156

<211> 509

<212> DNA

<213> Homo sapien

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<220>

<221> misc_feature

<222> (1)...(509)

<223> n = A,T,C or G

<400> 156

ggcacgagga	cagagagaac	cctgtngaaa	gagcgttacc	aggaggtcct	ggacaaacag	60
aggcaagtgg	agaatcagct	ccaagtgcaa	ttaaagcagc	ttcagcaaag	gagagaagag	120
gaaatgaaga	atcaccagga	gatattaaag	gctattcagg	atgtgacaat	aaagcgggaa	180
gaaacaaaga	agaagataga	gaaagagaag	aaggagtgtt	tgcagaagga	gcaggatctg	240
aaagctgaaa	ttgagaagct	ttgtgagaag	ggcagaagag	aggtgtggga	aatggaactg	300
gatagactca	agaatcagga	tggcgaaata	aataggaaca	ttatggaaga	gactgaaacg	360
gcctgggaag	cagagatctt	atcactagag	agccggaaa	agttactggt	actgaaacta	420
gaagaagcag	aaaaagaggc	agaattgcac	cttacttacc	tcaagtcaac	tcccccaaca	480
ctggagacag	ttcgttccaa	acaggagtg				509

<210> 157

<211> 507

<212> DNA

<213> Homo sapien

<400> 157

ggcacgaggg	cagccctcct	accggcgcac	gtgggtgccg	cgctgctgac	tcccgtctgc	60
cctgaaccca	gtgcctgcag	ccatggctcc	cggccagctc	gccttattta	gtgtctctga	120
caaaaccggc	cttgtggaat	ttgcaagaaa	cctgaccgct	cttgggttga	atctggctgc	180
ttccggaggg	actgcaaaa	ctctcaggga	tgtgtgtctg	gcagtcagag	atgtctctga	240
gttgacggga	tttctgaaa	tgttgggggg	acgtgtgaaa	actttgcac	ctgcagtcca	300
tgttggaatc	ctagctcgta	atattccaga	agataatgct	gacatggcca	gacttgattt	360
caatcttata	agagttgttg	cctgcaatct	ctatcccttt	gtaaagacag	tggcttctcc	420
aggtgtaagt	gttgaggagg	ctgtggagca	aattgacatt	gggtggagta	ccttactgag	480
agctgcagcc	aaaaaccacg	ctcgagt				507

<210> 158

<211> 507

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(507)

<223> n = A,T,C or G

<400> 158

ggcacgagtc	gagctgtgcc	tattcgngtc	aatccaagag	tgagtaatgt	gaagtctgtc	60
tacaaaaccc	acattgatgt	cattcattat	cggaaaacg	atgcaaaacg	tctgcatggc	120
cttgatgaag	aagcagaaca	gaaacttttt	tcagagaaac	gtgtggaatt	gcttaaggaa	180
ctttccagga	aaccagacat	ttatgagagg	cttgcttcag	ccttggctcc	aagcatttat	240
gaacatgaag	atataaagaa	gggaattttg	cttcagctct	ttggcgggac	aaggaaggat	300
tttagtcaca	ctggaagggg	caaatttcgg	gctgagatca	acatcttgct	gtgtggcgac	360
cctggtacca	gcaagtccca	gctgctgcag	tacgtgtaca	acctcgtccc	caggggccag	420
tacacgtntg	ggaagggtcc	cagtgcannt	ggcctnactg	cntacgtaat	gaaagacctt	480
gagacaaggn	anctggnnct	gnnacag				507

<210> 159

<211> 508

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<212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(508)
 <223> n = A,T,C or G

<400> 159
 ggcacnanaa accaggatta tggtnnggat ccaaagattg ctaatgcaat aatgaaggca 60
 gcagatgagg tagctgaagg taaattaaat gatcattttc ctctcgtggt atggcagact 120
 ggatcaggaa ctcagacaaa tatgaatgta aatgaagtca ttagcaatag agcaattgaa 180
 atgttagggag gtgaacttgg cagcaagata cctgtgcac ccaacgatca tgtaataaaa 240
 agccagagct caaatgatac ttttcccaca gcaatgcaca ttgctgctgc aatagaagtt 300
 catgaagtac tgttaccagg actacagaag ttacatgatg ctcttgatgc aaaatccaaa 360
 gagtttgac agatcatcaa gattggacgt actcatactc aggatgctgt tccacttact 420
 cttgggcagg aatttagtgg ttatgttcaa caagtaaaat atgcaatgac aagaataaaa 480
 gctgccatgc caagaatcta tgagctcg 508

<210> 160
 <211> 508
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(508)
 <223> n = A,T,C or G

<400> 160
 ggcacgagct tggagcaaag tcactctnaag gaattagagg acacacttca ggtaggcac 60
 atacaagagt ttgagaagg ttagacagac cacagagttt ctttggagga attaaaaaag 120
 gaaaaccaac aaataattaa tcaaatacaa gaatctcatg ctgaaattat ccaggaaaaa 180
 gaaaacacgt tacaggaatt aaaactcaag gtttctgatt tgcagacac gagatgcaag 240
 ttagaggttg aacttgctgt gaaggaagca gaaactgatg aaataaaaat tttgctggaa 300
 gaaagcagag ccagcagaa ggagaccttg aaatctcttc ttgaacaaga gacagaaaat 360
 ttgagaacag aaattagtaa actcaaccaa aagattcagg ataataatga aaattatcag 420
 gtgggcttag cagagctaag aactttaatg acaattgaaa aagatcagtg tatttccgag 480
 ttaattagta gacatgaaga agaattcta 508

<210> 161
 <211> 507
 <212> DNA
 <213> Homo sapien

<400> 161
 ggcacgagcg ctaccggcgc ctctctcgcg gccactgagc cggagccggc ctgagcagcg 60
 ctctcggttg cagtaccac tggaaggact taggcgctcg cgtggacacc gcaagcccct 120
 cagtgcctc ggcccaagag gcctgcttc cactcgctag ccccgccggg ggtccgtgtc 180
 ctgtctcggt ggccggaccc gggcccgagc ccgagcagta gccggcgcca tgcggtggt 240
 gggcatagac ctgggcttcc agagctgcta cgctcgctg gcccgcgccc gcggcatcga 300
 gactatcgct aatgagtata gcgaccgctg cagcccggtc tgcatttctt ttggtcctaa 360
 gaatcgctca attggagcag cagctaaaag ccaggtaatt tctaatagca agaacacagt 420
 ccaaggattt aaaagattcc atggccgagc attctctgat ccatttgtgg aggcagaaaa 480
 atctaaccctt gcatatgata ttgtgca 507

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<210> 162
 <211> 507
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(507)
 <223> n = A,T,C or G

<400> 162
 ggacagagca gctgtgcacc gacatgntct cagtgtcctg agtaagacca aagaagctgg 60
 caagatcctc tctaataatc ccagcaaggg actggccctg ggaattgcc aagcctggga 120
 gctctacggc tcacccaatg ctctgggtgct actgattgct caagagaagg aaagaaacat 180
 atttgaccag cgtgccatag agaatgagct actggccagg aacatccatg tgatccgacg 240
 aacatttgaa gatattctctg aaaaggggtc tctggaccaa gaccgaaggc tgtttgtgga 300
 tggccaggaa attgctgtgg ttacttccg ggatggctac atgcctcgtc agtacagtct 360
 acagaattgg gaagcacgtc tactgctgga gaggtcacat gctgccaagt gccagacat 420
 tgccacccag ctggctggga ctaagaagg gcagcaggag ctaagcaggc cgggcatgct 480
 ggagatgttg ctccctggcc agcctga 507

<210> 163
 <211> 460
 <212> DNA
 <213> Homo sapien

<400> 163
 ggacagagaa ataactttat ttcattgtgg gtcgcgggtc ttgtttgtgg atcgtctgta 60
 tcgtcacttg acaatgcaga tcttcgtgaa gactctgact ggtaagacca tcaccctcga 120
 gggtgagccc agtgacacca tcgagaatgt caaggcaaa atccaagata aggaaggcat 180
 ccctcctgac cagcagaggc tgatctttgc tggaaaacag ctggaagatg ggcgcaccct 240
 gtctgactac aacatccaga aagagtccac cctgcacctg gtgctccgtc tcagagggtg 300
 gatgcaaate ttctggaaga cactcactgg caagaccatc acccttgagg tggagcccag 360
 tgacaccatc gagaacgtca aagcaaagat ccaggacaag gaaggcattc ctctgacca 420
 gcagagggtg atctttgccg gaaagcagct ggaagatggg 460

<210> 164
 <211> 462
 <212> DNA
 <213> Homo sapien

<400> 164
 ggacagagcc ggatctcatt gccacgcgcc cccgacgacc gcccgacgtg cattcccgat 60
 tctcttttgg tccaagtcca atatggcaac tctaaaggat cagctgattt ataattcttct 120
 aaaggaagaa cagacccccc agaataagat tacagttggt ggggttgggt ctgttggcat 180
 ggctgtgcc atcagtatct taatgaagga cttggcagat gaacttgctc ttgttgatgt 240
 catcgaagac aaattgaagg gagagatgat ggatctccaa catggcagcc ttttccttag 300
 aacaccaaag attgtctctg gcaaagacta taatgtaact gcaaactcca agctggctcat 360
 tatcacggct ggggcacgtc agcaagagg agaaaagcgt cttaatttgg tccagcgtaa 420
 cgtgaacatc tttaaattca tcattcctaa tgttgtaaaa ta 462

<210> 165
 <211> 462
 <212> DNA

<213> Homo sapien

<400> 165

ggcacgagga agccatgagc agcaaagtct ctcgcgacac cctgtacgag gcggtgcggg	60
aagtcttgca cgggaaccag cgcaagcgcc gcaagttcct ggagacggtg gagttgcaga	120
tcagcttgaa gaactatgat cccagaagg acaagcgctt ctcgggcacc gtcaggctta	180
agtccactcc ccgccctaag ttctctgtgt gtgtcctggg ggaccagcag cactgtgacg	240
aggctaaggc cgtggatata cccacatgg acatcgaggc gctgaaaaaa ctcaacaaga	300
ataaaaaact ggtcaagaag ctggccaaga agtatgatgc gtttttggcc tcagagtctc	360
tgatcaagca gattccacga atcctcgccc caggtttaaa taaggcagga aagttccctt	420
ccctgctcac acacaacgaa aacatggtgg ccaaagtgga tg	462

<210> 166

<211> 459

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(459)

<223> n = A,T,C or G

<400> 166

ggcacgagag ggacctgtnt gaatggntcc actagggtnn anntgntctt tacttttaac	60
cantnaaata gacctgccc tgaanangcg ggcntgacac annaanacga gaagacccta	120
tggagcttta atttattaat gcanacagna cctaacaaac ccacangtcc taaactacca	180
agcctgcatt aaaaatttcg gntggggcna cctcnnagca naaccacaacc tccgagcaac	240
tcattgctaag acttcaccag tcaaagctga actactatac tcaattgatc caataacttg	300
accaacagan caagntaccc tagggataac ancacaatcc tattctagac cccttatnac	360
caatangntt tacacctcna tngnggaacc aggacatccg atggggcagn cgttattaaa	420
gttngttgnt aacnataaag tctacgtgat ctgagttag	459

<210> 167

<211> 464

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(464)

<223> n = A,T,C or G

<400> 167

gaattgggac caacganaan cntgcggnct ttnttttgcg tccanngccc agctnattgc	60
tcagacacac atggggaagg tnaaggctcg gagtcaacng atttggtngt attgnagcgt	120
ttggtcacca gngctgcttt taactctggn aaagtggata ttgttgatcat naatgacccc	180
tncattgacc tnaactacat ggtttacatg ttccaatatg attccaccca tggcaaattc	240
catngcaccg tnaaggctga gaacgggaag cttgtnatca atggaaatcc catcaccatc	300
tttcangaac ganatccntn caaaaatcaa anttgggggc gatgcttggc cncctgaagt	360
accgttcaan gggaannncc ccactttggc cgntntttnc aanccacccc caatttgggn	420
aaaaaaaaag gggnttttgg gggggggcct tttanntttt tttt	464

<210> 168

<211> 462

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(462)

<223> n = A,T,C or G

<400> 168

ggcacgaggn nnaacctnccg gggctggggc agcacgcctt gngcaancct gcaactgcact	60
gaagaccgcg tgccggaagc cgngggcngc nacatgcagn aactgaacca gctgggcgcg	120
cancagttct cagacctgac agaggtgctt ttacacttcc taactgatcc anantangtg	180
gaaatattnt tngttnatnt catntgaatn atccancncc aatcatancc nntttnatnt	240
cctcataanc nttgagaana gcnnccctnt gnttncanan ggtgctntga anangagtct	300
cacangcaan caggctcaag cggatttntt aactntgggt cttantgang agaaagncac	360
ttacttttct gaaancngga agcagaatgc tcccaccctt gctcgatggg ccatacgtca	420
agactctgat gattaaccag ctttanatat ggaacnggaa tt	462

<210> 169

<211> 460

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(460)

<223> n = A,T,C or G

<400> 169

ggcacgaggg acagcagacn agacagtcac agcagccttg acaaaacgtt cctggaactc	60
aagntcttnt ncncaaagga ggacagagca nacagcagag accatggant ctncctcggc	120
ccctcccccac agatggtgca tcccctggca naggtccttg ctcacagcct cacttctaac	180
cttctggaac ccgcccacca ctgccaagct cactattgaa tccacgccgt tcaatgnntc	240
ntagggggaag gagngcttt ctactnttnc acaatctgan ccccttcttn tttggttact	300
ancatggctc tncatgtnaa aatactgnaa tggntaacct gtcaaattta taggnantnt	360
gctaattggg aaactnccnn tngtctaccc caggggnccc agattcctnn gttcncataa	420
cnattaattt aaccctaat gncaancctt tngttaaaga	460

<210> 170

<211> 508

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(508)

<223> n = A,T,C or G

<400> 170

ggcacgaggg ggatttttag gtggtcnggt gtggtatcag gaataatgtg ggaggccaga	60
ttgaagtcca ggccaggaac aatggtaatt gtgggactta agaaagtgtg agtacagctg	120
aatgagccgg ggagcagaaa gtatatgcgt caggtatgag gaagaaaata gattttggaa	180
gttatgagaa atgtagagag tgagttgagc atagtttgtg attttgaggg cctctaacag	240
tattaaagca gcggcagcgg ctgcacacag acatgatggc taggctaata cagggaagtc	300
aagttgtttg gacagaaagg ctacaggggtg cagtcctggc tcttggtgaa gaattctgac	360
cacactaacc atgcctagga aggaaaggag ttgttctttt gtaagggatt gaggtttggg	420

agattaatcg gacacgatca gcagggagag cacctgtgtt tttatgagaa ttatgctgag 480
ataggttaaca gatgaggatg aaatttgg 508

<210> 171

<211> 507

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(507)

<223> n = A,T,C or G

<400> 171

ggcacgagac cagccactag cgcagactcg agcgaaggcc tatgtccccc caccgggcta 60
ccagcccacc tacaaccgga cgctgcctta ctaccagccc atccccggcg ggctcaacgt 120
gggaatgtct gtttacatcc aaggagtggc cagcgagcac atgaagcggg tcttcgtgaa 180
ctttgtggtt gggcaggatc cgggctcaga cgtcgccttc cacttcaatc cgcggttga 240
cggctgggac aaggtggtct tcaacacgtt gcagggcggg aagtggggca gcgaggagag 300
gaagaggagc atgcccttca aaaaggggtgc cgcctttgag ctggtcttca tagtcctggc 360
tgagcactac aaggtggtgg taaatggaaa tcccttctat gagtacgggc accggcttcc 420
cctacagatg gtcacccacc tgcaagtggg tggggatctg caacttcaat caatcaactt 480
catcggaggc cagcccctcc ggcccca 507

<210> 172

<211> 409

<212> DNA

<213> Homo sapien

<400> 172

ggcacgagct ggagtgtctg ctgccacccc ctgcctctct gcagaaatgt ctgtcaccta 60
cgatgactct gtgggagtgg aagtgtccag cgacagcttc tgggagggtg ggaactacaa 120
acggactgtg aagcggattg acgatggcca ccgctgtgtt ggtgacctca tgaactgtct 180
gcatgagcgg gcacgcatcg agaaggcgta tgcacagcag ctactgagt gggcccgcag 240
ctggaggcag ctggtagaga agggaccaca gtatgggacc gtggagaagg cctggatagc 300
tgtcatgtct gaagcagaga ggggtgagtga actgcacctg gaagtgaagg catcactgat 360
gaatgaagac tttgagaaga tcaagaactg gcagaaggaa gcctttcac 409

<210> 173

<211> 409

<212> DNA

<213> Homo sapien

<400> 173

ggcacgaggg cagctagagg aagagtccaa ggccaagaac gcactggccc acgccctgca 60
gtcagctcgc catgactgtg acctgctgcg ggaacagtat gaagaggagc aggaagccaa 120
ggctgagctg cagagggcca tgtccaaggc caacagcgag gtagcccagt ggaggacgaa 180
atatgagacg gatgccatcc agcgcacaga ggagctggaa gaggccaaga agaagctggc 240
tcagcgtctg caggatgctg aggaacatgt agaagctgtg aattccaaat gcgcttctct 300
tgaaaagacg aagcagcgac ttcagaatga agtggaggac ctcagtattg acgtggagag 360
gtctaagtct gcctgcgctg cgcttgataa gaagcagagg aactttgac 409

<210> 174

<211> 407

<212> DNA

<213> Homo sapien

<400> 174

ggcacgagcc	ggggcggggc	gcggcgctcc	ggctcgaggc	attcgagact	gcgggagccg	60
ggctggcagg	agcaggatgg	cgggcgcgcc	ggctgcaggc	gaggcgcgcc	gggtgctggt	120
gtacggcgcc	agggcgctc	tgggttctcg	atgcgtgcag	gcttttcggg	cccgcaactg	180
gtgggttgcc	agcgttgatg	tgggtggagaa	tgaagaggcc	agcgctagca	tcattgttaa	240
aatgacagac	tcgttcactg	agcaggctga	ccagggtgact	gctgaggttg	gaaagctctt	300
gggtgaagag	aaggtggatg	caattctttg	cggtgctgga	ggatgggccc	ggggcaatgc	360
caaatccaag	tctctcttta	agaactgtga	cctgatgtgg	aagcaga		407

<210> 175

<211> 407

<212> DNA

<213> Homo sapien

<400> 175

ggcacgagct	tggccgtcgg	tcgctagctc	gctcggtgcg	cgctgctccc	ctccatggcg	60
ctcttcgtgc	ggctgctggc	tctcgccctg	gctctggccc	tgggccccgc	cgcgaccctg	120
gcgggtccc	ccaagtcgcc	ctaccagctg	gtgctgcagc	acagcaggct	ccggggccgc	180
cagcacggcc	ccaacgtgtg	tgtgtgcag	aaggttattg	gcactaatag	gaagtacttc	240
accaactgca	agcagtggta	ccaaaggaaa	atctgtggca	aatcaacagt	catcagctac	300
gagtgtgtgc	ctggatatga	aaaggctcc	ggggagaagg	gctgtccagc	agccctacca	360
ctctcaaacc	tttacgagac	cctgggagtc	gttggtatcca	ccaccac		407

<210> 176

<211> 409

<212> DNA

<213> Homo sapien

<400> 176

ggcacgagtg	gtgccaaaac	gggaccatgc	cctcctggag	gagcagagca	agcagcagtc	60
caacgagcac	ctgcgcccgc	agttcgccag	ccaggccaat	gttgtggggc	cctggatcca	120
gaaccaagatg	gaggagatcg	ggcgcatctc	cattgagatg	aacgggaccc	tggaggacca	180
gctgagccac	ctgaagcagt	atgaacgcag	catcgtggac	tacaagcccc	acctggacct	240
gctggagcag	cagcaccagc	tcattccagga	ggccctcatc	ttcgacaaca	agcacaccaa	300
ctataccatg	gagcacatcc	gcgtgggctg	ggagcagctg	ctcaccacca	ttgcccgcac	360
catcaacgag	gtggagaacc	agatcctcac	ccgcgacgcc	aagggcatc		409

<210> 177

<211> 408

<212> DNA

<213> Homo sapien

<400> 177

ggcacgaggt	ccaggtaact	gcaaaaaaaa	tggctcagca	tgaagaactg	atgaagaaaa	60
ctgaacaat	gaatgtagtt	atggagacca	ataaaatgct	aagagaagag	aaggagcagg	120
tttcaaaaat	ggcatcagtc	cgtcagcatt	tggagaagaa	aacacagaaa	gcagaatcac	180
agttgttgga	gtgtaaagca	tcttgggagg	aaagagagag	aatgttaaag	gatgaagttt	240
ccaaatgtgt	atgtcgctgt	gaagatctgg	agaaacaaaa	cagattactt	catgatcaga	300
tcgaaaaatt	aagtgacaag	gtcgttgcc	ctgtgaagga	aggtgtacaa	gggtccactga	360
atgtatctct	cagtgaagaa	ggaaaatctc	aagaacaaat	tttggaaa		408

<210> 178

<211> 92

<212> DNA

<213> Homo sapien

<400> 178

ggcacgagaa gaaattaaga gctaaagaca aggagaatga aaatatgggt gcaaagctga 60
acaaaaaagt taaagagcta gaagaggaga tg 92

<210> 179

<211> 411

<212> DNA

<213> Homo sapien

<400> 179

ggcacgagga gacacgccac ctataccaca gttctcagaa tgaattagct aagttggaat 60
cagaacttaa gagtctcaaa gaccagttga ctgatttaag taactcttta gaaaaatgta 120
aggaacaaaa aggaaacttg gaaggatca taaggcagca agaggctgat attcaaaatt 180
ctaagttcag ttatgaacaa ctggagactg atcttcaggc ctccagagaa ctgaccagta 240
ggctgcatga agaaataaat atgaaagagc aaaagattat aagcctgctt tctggcaagg 300
aagaggcaat ccaagtagct attgctgaac tgcgtcagca acatgataaa gaaattaaag 360
agctggaaaa cctgctgtcc caggaggaag aggagaatat tgttttagaa g 411

<210> 180

<211> 411

<212> DNA

<213> Homo sapien

<400> 180

ggcacgaggt tgttcggagc gggcgagcgg agttagcagg gctttactgc agagcgcgcc 60
gggcactcca gcgaccgtgg ggatcagcgt aggtgagctg tggccttttg cgaggtgctg 120
cagccatagc tacgtgcgtt cgctacgagg attgagcgtc tccacccatc ttctgtgctt 180
caccatctac ataatgaatc ccagtatgaa gcagaaacaa gaagaaatca aagagaatat 240
aaagactagt tctgtcccaa gaagaactct gaagatgatt cagccttctg catctggatc 300
tcttgttgga agagaaaatg agctgtccgc aggtctgtcc aaaaggaaac atcggaatga 360
ccacttaaca tctacaactt ccagccctgg ggttattgtc ccagaatcta g 411

<210> 181

<211> 411

<212> DNA

<213> Homo sapien

<400> 181

ggcacgaggc gggacagggc gaagcggcct gcgcccacgg agcgcgcgac actgcccgga 60
agggaccgcc acccttgccc cctcagctgc ccactcgtga tttccagcgg cctccgcgcg 120
cgcacgatgc cctcggccac cagccacagc gggagcggca gcaagtcgtc cggaccgcca 180
ccgccgtcgg gttctccggg gagtgaggcg gccgcgggag ccggggccgc cgcgccggct 240
tctcagcacc ccgcaaccgg caccggcgct gtccagaccg aggccatgaa gcagattctc 300
ggggtgatcg acaagaaact tcggaacctg gagaagaaaa agggtaagct tgatgattac 360
caggaacgaa tgaacaaagg ggaaaggctt aatcaagatc agctggatgc c 411

<210> 182

<211> 411

<212> DNA

<213> Homo sapien

<400> 182

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ggcacgagcc gacatggagc tgttcctcgc gggccgcccgg gtgctgggtca ccggggcagg      60
caaaggtata gggcgccgca cgggtccaggc gctgcacgcg acggggcgcg gggtgggtggc      120
tgtgagccgg actcaggcgg atcttgacag ccttgctccgc gagtggcccg ggatagaacc      180
cgtgtgcgtg gacctgggtg actgggaggc caccgagcgg gcgctgggca gcgtggggccc      240
cgtggacctg ctggtgaaca acgcccgtgt cgccctgctg cagcccttcc tggaggtcac      300
caaggaggcc tttgacagat cctttgaggt gaacctgcgt gcggtcatcc aggtgtcgca      360
gattgtggcc aggggcttaa tagcccgggg agtcccaggg gccatcgtga a                  411

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<210> 183

<211> 409

<212> DNA

<213> Homo sapien

<400> 183

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ggcacgagcc tacactctgg ccagagatac cacagtcaaa cctggagcca aaaaggacac      60
aaaggactct cgacccaaac tgccccagac cctctccaga ggttgggggtg accaactcat      120
ctggactcag acatatgaag aagctctata taaatccaag acaagcaaca aacccttgat      180
gattattcat cacttggatg agtgcccaca cagtcaagct ttaaagaaag tgtttctgta      240
aaataaagaa atccagaaat tggcagagca gtttgtcctc ctcaatctgg tttatgaaac      300
aactgacaaa cacctttctc ctgatggcca gtatgtcccc aggattatgt ttgttgaccc      360
atctctgaca gttagagccg atatcactgg aagatattca aatcgtctc                  409

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<210> 184

<211> 410

<212> DNA

<213> Homo sapien

<400> 184

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ggcacgaggt cattccagca ccaacaggat ccaagccaga ttgattgggc tgcattggcc      60
caagcttgga ttgccc aaag agaagcttca ggacagcaaa gcatggtaga acaaccacca      120
ggaatgatgc caaatggaca agatatgtct acaatggaat ctggtccaaa caatcatggg      180
aatttccaag gggattcaaa cttcaacaga atgtggcaac cagaatgggg aatgcatcag      240
caacccccac acccccctcc agatcagcca tggatgccac caacaccagg cccaatggac      300
attgttcctc cttctgaaga cagcaacagt caggacagtg gggaatttgc ccctgacaac      360
aggcatatat ttaaccagaa caatcacaac tttggtggac caccgcataa                  410

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<210> 185

<211> 411

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(411)

<223> n = A,T,C or G

<400> 185

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ggcacgagca cagatgtagt tttctctgcg cgtgtgcgtt ttccctcctc ccccgccctc      60
agggtccacg gccaccatgg cgtattaggg gcagcagtg ctcgggcagc attggccttt      120
gcagcggcgg cagcagcacc aggtcttgca gcggcaaccc ccagcggtt aagccatggc      180
gcttctcacg gcattcagca gcagcgttgc tgtaaccgac aaagacacct tcgaattaag      240
cacattcctc gattccagca aagcaccgca acatgaccga aatgagcttc ctgagcagcg      300
agggtgttgg gggggacttg atgtccccct tcgaccgcgc gggtttgggg gctgaagaaa      360
gcctangtct cttagatgat tacctggagg tggccaagca cttcaaacct c                  411

```

<210> 186
 <211> 410
 <212> DNA
 <213> Homo sapien

<400> 186
 ggcacgagct tctagtcccc ccattggccgc tctcaccgag gacccccagt tccagaagct 60
 gcagcaatgg taccgcgagc accgctccga gctgaacctg cgccgcctct tcgatgccaa 120
 caaggaccgc ttcaaccact tcagcttgac cctcaacacc aaccatgggc atatcctggt 180
 ggattactcc aagaacctgg tgacggagga cgtgatgcgg atgctggtgg acttgccaa 240
 gtccaggggc gtggaggccg cccgggagcg gatgttcaat ggtgagaaga tcaactacac 300
 cgaggggtcga gccgtgctgc acgtggctct gcggaaccgg tcaaacacac ccattcctggt 360
 agacggcaag gatgtgatgc cagagggtcaa caagggtctg gacaagatga 410

<210> 187
 <211> 506
 <212> DNA
 <213> Homo sapien

<400> 187
 ctttcgtggc tcaactccctt tcctctgctg ccgctcggtc acgcttggtg ccgaaggagg 60
 aaacagtgc agacctggag actgcagttc tctatccctc acacagctct ttcacatgc 120
 ctggatcact tcccttgaat gcagaagctt gctggccaaa agatgtggga attgttgccc 180
 ttgagatcta ttttccttct caatatgttg atcaagcaga gttggaaaaa tatgatggtg 240
 tagatgctgg aaagtatacc attggcttgg gccaggccaa gatgggcttc tgcacagata 300
 gagaagatat taactctctt tgcagtactg tgggtcagaa tcttatggag agaaataacc 360
 tttcctatga ttgcattggg cggtggaag ttggaacaga gacaatcatc gacaaatcaa 420
 agtctgtgaa gactaatttg atgcagctgt ttggaagagtc tgggaatata gatatagaag 480
 gaatcgacac aactaatgca tgctat 506

<210> 188
 <211> 506
 <212> DNA
 <213> Homo sapien

<400> 188
 gccacagagg cggcgagag atggccttca gcggttccca ggctccctac ctgagtccag 60
 ctgtccctt tctctgggact attcaaggag gtctccagga cggacttcag atcactgtca 120
 atgggaccgt tctcagctcc agtggaaaca ggtttgctgt gaactttcag actggcttca 180
 gtggaaatga cattgccttc cacttcaacc ctcggtttga agatggaggg tacgtggtgt 240
 gcaacacgag gcagaacgga agctgggggc ccgaggagag gaagacacac atgcctttcc 300
 agaaggggat gccctttgac ctctgcttcc tgggtcagag ctcagatttc aaggtgatgg 360
 tgaacgggat cctcttcgtg cagtacttcc accgcgtgcc ctccaccgt gtggacacca 420
 tctccgtcaa tggctctgtg cagctgtcct acatcagctt ccagcctccc ggcgtgtggc 480
 ctgccaaacc ggctccctatt acccag 506

<210> 189
 <211> 399
 <212> DNA
 <213> Homo sapien

<400> 189
 ctggacagga gaagagcctg gctgctgaag gcagggctga caccgaccacg ggcagcattg 60
 ctggagcccc agaggatgaa agatcgaga gcacagcccc ccaggcacca gactgcttcg 120
 accctgcccg accggctggg ctcgtgaggc cgacatctgg cctttccag ggcccaggaa 180

aggaaacctt ggaaagtgt ctaatcgctc tagactctga aaaacccaag aaacttcgct	240
tccacccaaa gcagctgtac ttctctgcca ggcaggggtga gctgcagaag gtgcttctca	300
tgctgggtga tggaattgat cccaacttca aaatggagca ccaaagtaag cgttccccat	360
tacatgctgc tgcggaggct ggccacgtgg acatctgcc	399

<210> 190

<211> 401

<212> DNA

<213> Homo sapien

<400> 190

cggcgacggg ggtgggtgact gagcggagcc cggtgacagg atgttggtgt tggtattagg	60
agatctgcac atcccacacc ggtgcaacag ttgtccagct aaattcaaaa aactcctggt	120
gccaggaaaa attcagcaca ttctctgcac aggaaacctt tgcaccaaag agagttaga	180
ctatctcaag actctggctg gtgatgttca tattgtgaga ggagacttcg atgagaatct	240
gaattatcca gaacagaaaag ttgtgactgt tggacagttc aaaattggtc tgatccatgg	300
acatcaagtt attccatggg gagatatggc cagcttagcc ctgttgcaga ggcaatttga	360
tgtggacatt cttatctcgg gacacacaca caaatttgaa g	401

<210> 191

<211> 406

<212> DNA

<213> Homo sapien

<400> 191

tggcagccta agccgtggga ggggtccagt cgagaatggg aagatgaaag acttcagatg	60
gaacagaaat aaatgccttt ttgacaaac gcagcagtg cgtgcctctag cttgcaagag	120
cgttactccc cttcatagct ttaaaagggt ttgcactgc gtgcagttag agtagctaaa	180
tcttgtgtga cgtccacaa acacttgtaa gaattttgca gagaaagata accgttgcca	240
cccaatgccc cccacaggca ttctactccc cagtacctct taggggtggga gaaatgggta	300
agagttgttc ctacaacttg ctaacctagt ggacagggta gtagattagc atcatccgga	360
tagatgtgaa gaggacggct gtttgataa taattaagga taaaat	406

<210> 192

<211> 316

<212> DNA

<213> Homo sapien

<400> 192

cccggggagg ccttggtcat aaaacttta attttactag tgttacttaa tgtatattct	60
aaaaagagaa tgcagtaact aatgccctaa atgtttgatc tctgtttgtc attacttttt	120
caaaattatt tttttctgta aagtataata tataaaactt cttgcttaaa ttgaatttct	180
atattagtgg ttaattgcag tttattaag ggatcattat cagtaatttc atagcaactg	240
ttctagtgtt ttgtgttttt aaaacagaat taggaatttg agatatctga ttatattttt	300
catatgaatc acagac	316

<210> 193

<211> 146

<212> DNA

<213> Homo sapien

<400> 193

gaaacatgga ctgcccccta aattttgact gtccataaaa cctatttctg atttataata	60
tgctgcctga taaagtga ctagatgtac cagctgagtg ttaattctt ccatcacaga	120
tcagatttga gcattaacag gtattt	146

<210> 194
 <211> 405
 <212> DNA
 <213> Homo sapien

<400> 194
 cggatgtgct cactgacatt ctactccaag tcggagatgc agatccactc caagtccacac 60
 accgagacca agccccacaa gtgcccacat tgctccaaga ccttcgcca cagctcctac 120
 ctggcccagc acatccgtat acactcaggg gctaagccct acagttgtaa cttctgtgag 180
 aaatccttcc gccagctctc ccaccttcag cagcacaccc gaatccacac tggatgata 240
 ccatacaaat gtgcacaccc aggtgtgag aaagccttca cacaactctc caatctgcag 300
 tcccacagac ggcaacacaa caaagataaa cccttcaagt gccacaactg tcatcgggcg 360
 tacacggatg cagcctcact agaggtgcac ctgtctacgc acaca 405

<210> 195
 <211> 421
 <212> DNA
 <213> Homo sapien

<400> 195
 agaattcggc acgagctact ccttcgcgcg tggcactccg cagcctttaa ggttcgcgcg 60
 ggggccaggc aagagtttag catgaagagc ctcaagtccc gcctgaggag gcaggacgtg 120
 cccggccccg cgtcgtctgg cgccgccgcc gccagcgcgc atgcagcaga ttggaataaa 180
 tatgatgacc gattgatgaa agcagcagaa aggggggatg tagaaaaagt gacgtcaatc 240
 cttgctaaaa agggggtcaa tccaggcaaa ctagatgtgg aaggcagatc tgtcttccat 300
 gttgtgacct caaaggggaa tcttgagtgt ttgaatgcca tccttataca tggagttgat 360
 attacaacca gtgacactgc agggagaaat gctcttcacc tggctgctaa gtatggacat 420
 g 421

<210> 196
 <211> 476
 <212> DNA
 <213> Homo sapien

<400> 196
 agaattgatc tatagattta atgcaatgcc tactaaaatc ccagtacgat tttttacagg 60
 catagacaat agacatagcc aaaacttatt ctaaaataca tatgaagatg cacaggccct 120
 agttatacaa tcttgacaaa gaagaataaa gtgggaagaa tctatttgat ttttaaggctt 180
 accatgtaac tacagtcac cagagagtgt ggtatcggca gacggtcaga catacagatc 240
 aatggaatgt aacagaggac ccagaaatag gcccacacag atatgctcaa tggatatttg 300
 acaagcgtgc aaaacaattc aatggaagaa taagctttca aaaaaatggc gttggagcaa 360
 ccggacatcc ataggaaaaa atgaacccat acctaaacca taaaccttat ataaaaataa 420
 acacaaaatg aatcataggg ttaaatgtaa gctataaaac ttttagagaa aaacac 476

<210> 197
 <211> 503
 <212> DNA
 <213> Homo sapien

<400> 197
 tagccctcgg tgaagcccca gaccacagct atgagtcctt tcgtgtgacg tctgcgcaga 60
 aacatgttct gcatgtccag ctcaaccggc ccaacaagag gaatgccatg aacaaggtct 120
 tctggagaga gatggtagag tgcttcaaca agatttcgag agacgctgac tgcgggcgg 180
 tggatgctc tgggtgcagga aaaatgttca ctgcaggtat tgacctgatg gacatggctt 240

cggacatcct gcagcccaaa ggagatgatg tggcccgat cagctggtac ctccgtgaca 300
 tcatcactcg ataccaggag accttcaacg tcatcgagag gtgccccaaag cccgtgattg 360
 ctgccgtcca tgggggctgc attggcggag gtgtggacct tgtcaccgcc tgtgacatcc 420
 ggtactgtgc ccaggatgct ttcttccagg tgaaggaggt ggacgtgggt ttggctgccc 480
 atgtaggaac actgcagcgc ctg 503

<210> 198

<211> 168

<212> PRT

<213> Homo sapien

<400> 198

Phe Val Ala His Ser Leu Ser Ser Ala Ala Ala Arg Ser Arg Leu Cys
 1 5 10 15
 Pro Lys Glu Glu Thr Val Thr Asp Leu Glu Thr Ala Val Leu Tyr Pro
 20 25 30
 Ser His Ser Ser Phe Thr Met Pro Gly Ser Leu Pro Leu Asn Ala Glu
 35 40 45
 Ala Cys Trp Pro Lys Asp Val Gly Ile Val Ala Leu Glu Ile Tyr Phe
 50 55 60
 Pro Ser Gln Tyr Val Asp Gln Ala Glu Leu Glu Lys Tyr Asp Gly Val
 65 70 75 80
 Asp Ala Gly Lys Tyr Thr Ile Gly Leu Gly Gln Ala Lys Met Gly Phe
 85 90 95
 Cys Thr Asp Arg Glu Asp Ile Asn Ser Leu Cys Met Thr Val Val Gln
 100 105 110
 Asn Leu Met Glu Arg Asn Asn Leu Ser Tyr Asp Cys Ile Gly Arg Leu
 115 120 125
 Glu Val Gly Thr Glu Thr Ile Ile Asp Lys Ser Lys Ser Val Lys Thr
 130 135 140
 Asn Leu Met Gln Leu Phe Glu Glu Ser Gly Asn Thr Asp Ile Glu Gly
 145 150 155 160
 Ile Asp Thr Thr Asn Ala Cys Tyr
 165

<210> 199

<211> 168

<212> PRT

<213> Homo sapien

<400> 199

His Arg Gly Gly Glu Met Ala Phe Ser Gly Ser Gln Ala Pro Tyr
 1 5 10 15
 Leu Ser Pro Ala Val Pro Phe Ser Gly Thr Ile Gln Gly Gly Leu Gln
 20 25 30
 Asp Gly Leu Gln Ile Thr Val Asn Gly Thr Val Leu Ser Ser Ser Gly
 35 40 45
 Thr Arg Phe Ala Val Asn Phe Gln Thr Gly Phe Ser Gly Asn Asp Ile
 50 55 60
 Ala Phe His Phe Asn Pro Arg Phe Glu Asp Gly Gly Tyr Val Val Cys
 65 70 75 80
 Asn Thr Arg Gln Asn Gly Ser Trp Gly Pro Glu Glu Arg Lys Thr His
 85 90 95
 Met Pro Phe Gln Lys Gly Met Pro Phe Asp Leu Cys Phe Leu Val Gln
 100 105 110

Ser Ser Asp Phe Lys Val Met Val Asn Gly Ile Leu Phe Val Gln Tyr
 115 120 125
 Phe His Arg Val Pro Phe His Arg Val Asp Thr Ile Ser Val Asn Gly
 130 135 140
 Ser Val Gln Leu Ser Tyr Ile Ser Phe Gln Pro Pro Gly Val Trp Pro
 145 150 155 160
 Ala Asn Pro Ala Pro Ile Thr Gln
 165

<210> 200

<211> 132

<212> PRT

<213> Homo sapien

<400> 200

Gly Gln Glu Lys Ser Leu Ala Ala Glu Gly Arg Ala Asp Thr Thr Thr
 1 5 10 15
 Gly Ser Ile Ala Gly Ala Pro Glu Asp Glu Arg Ser Gln Ser Thr Ala
 20 25 30
 Pro Gln Ala Pro Glu Cys Phe Asp Pro Ala Gly Pro Ala Gly Leu Val
 35 40 45
 Arg Pro Thr Ser Gly Leu Ser Gln Gly Pro Gly Lys Glu Thr Leu Glu
 50 55 60
 Ser Ala Leu Ile Ala Leu Asp Ser Glu Lys Pro Lys Lys Leu Arg Phe
 65 70 75 80
 His Pro Lys Gln Leu Tyr Phe Ser Ala Arg Gln Gly Glu Leu Gln Lys
 85 90 95
 Val Leu Leu Met Leu Val Asp Gly Ile Asp Pro Asn Phe Lys Met Glu
 100 105 110
 His Gln Ser Lys Arg Ser Pro Leu His Ala Ala Ala Glu Ala Gly His
 115 120 125
 Val Asp Ile Cys
 130

<210> 201

<211> 120

<212> PRT

<213> Homo sapien

<400> 201

Met Leu Val Leu Val Leu Gly Asp Leu His Ile Pro His Arg Cys Asn
 1 5 10 15
 Ser Leu Pro Ala Lys Phe Lys Lys Leu Leu Val Pro Gly Lys Ile Gln
 20 25 30
 His Ile Leu Cys Thr Gly Asn Leu Cys Thr Lys Glu Ser Tyr Asp Tyr
 35 40 45
 Leu Lys Thr Leu Ala Gly Asp Val His Ile Val Arg Gly Asp Phe Asp
 50 55 60
 Glu Asn Leu Asn Tyr Pro Glu Gln Lys Val Val Thr Val Gly Gln Phe
 65 70 75 80
 Lys Ile Gly Leu Ile His Gly His Gln Val Ile Pro Trp Gly Asp Met
 85 90 95
 Ala Ser Leu Ala Leu Leu Gln Arg Gln Phe Asp Val Asp Ile Leu Ile
 100 105 110
 Ser Gly His Thr His Lys Phe Glu

115

120

<210> 202

<211> 135

<212> PRT

<213> Homo sapien

<400> 202

Arg	Met	Cys	Ser	Leu	Thr	Phe	Tyr	Ser	Lys	Ser	Glu	Met	Gln	Ile	His
1				5					10					15	
Ser	Lys	Ser	His	Thr	Glu	Thr	Lys	Pro	His	Lys	Cys	Pro	His	Cys	Ser
			20					25					30		
Lys	Thr	Phe	Ala	Asn	Ser	Ser	Tyr	Leu	Ala	Gln	His	Ile	Arg	Ile	His
		35					40					45			
Ser	Gly	Ala	Lys	Pro	Tyr	Ser	Cys	Asn	Phe	Cys	Glu	Lys	Ser	Phe	Arg
	50					55				60					
Gln	Leu	Ser	His	Leu	Gln	Gln	His	Thr	Arg	Ile	His	Thr	Gly	Asp	Arg
65					70					75				80	
Pro	Tyr	Lys	Cys	Ala	His	Pro	Gly	Cys	Glu	Lys	Ala	Phe	Thr	Gln	Leu
				85				90						95	
Ser	Asn	Leu	Gln	Ser	His	Arg	Arg	Gln	His	Asn	Lys	Asp	Lys	Pro	Phe
			100					105					110		
Lys	Cys	His	Asn	Cys	His	Arg	Ala	Tyr	Thr	Asp	Ala	Ala	Ser	Leu	Glu
		115					120					125			
Val	His	Leu	Ser	Thr	His	Thr									
		130				135									

<210> 203

<211> 135

<212> PRT

<213> Homo sapien

<400> 203

Leu	Leu	Leu	Ala	Arg	Trp	His	Ser	Ala	Ala	Phe	Lys	Val	Arg	Ala	Gly
1				5					10					15	
Ala	Arg	Gln	Glu	Leu	Ala	Met	Lys	Ser	Leu	Lys	Ser	Arg	Leu	Arg	Arg
		20					25					30			
Gln	Asp	Val	Pro	Gly	Pro	Ala	Ser	Ser	Gly	Ala	Ala	Ala	Ala	Ser	Ala
		35					40					45			
His	Ala	Ala	Asp	Trp	Asn	Lys	Tyr	Asp	Asp	Arg	Leu	Met	Lys	Ala	Ala
	50					55				60					
Glu	Arg	Gly	Asp	Val	Glu	Lys	Val	Thr	Ser	Ile	Leu	Ala	Lys	Lys	Gly
65					70					75				80	
Val	Asn	Pro	Gly	Lys	Leu	Asp	Val	Glu	Gly	Arg	Ser	Val	Phe	His	Val
			85					90					95		
Val	Thr	Ser	Lys	Gly	Asn	Leu	Glu	Cys	Leu	Asn	Ala	Ile	Leu	Ile	His
		100					105					110			
Gly	Val	Asp	Ile	Thr	Thr	Ser	Asp	Thr	Ala	Gly	Arg	Asn	Ala	Leu	His
		115				120						125			
Leu	Ala	Ala	Lys	Tyr	Gly	His									
		130				135									

<210> 204

<211> 167

<212> PRT

<213> Homo sapien

<400> 204

Ala Leu Gly Glu Ala Pro Asp His Ser Tyr Glu Ser Leu Arg Val Thr
 1 5 10 15
 Ser Ala Gln Lys His Val Leu His Val Gln Leu Asn Arg Pro Asn Lys
 20 25 30
 Arg Asn Ala Met Asn Lys Val Phe Trp Arg Glu Met Val Glu Cys Phe
 35 40 45
 Asn Lys Ile Ser Arg Asp Ala Asp Cys Arg Ala Val Val Ile Ser Gly
 50 55 60
 Ala Gly Lys Met Phe Thr Ala Gly Ile Asp Leu Met Asp Met Ala Ser
 65 70 75 80
 Asp Ile Leu Gln Pro Lys Gly Asp Asp Val Ala Arg Ile Ser Trp Tyr
 85 90 95
 Leu Arg Asp Ile Ile Thr Arg Tyr Gln Glu Thr Phe Asn Val Ile Glu
 100 105 110
 Arg Cys Pro Lys Pro Val Ile Ala Ala Val His Gly Gly Cys Ile Gly
 115 120 125
 Gly Gly Val Asp Leu Val Thr Ala Cys Asp Ile Arg Tyr Cys Ala Gln
 130 135 140
 Asp Ala Phe Phe Gln Val Lys Glu Val Asp Val Gly Leu Ala Ala His
 145 150 155 160
 Val Gly Thr Leu Gln Arg Leu
 165

<210> 205

<211> 381

<212> DNA

<213> Homo sapien

<400> 205

aaatttggga tcacgcctg ttctgaaaac tagatgcacc aaccgtatca ttatttggtt 60
 gaggaaaaaa agaaatctgc attttaattc atgttggtca aagtcgaatt actatctatt 120
 tatcttatat cgtagatctg ataaccctat ctaaaagaaa gtcacacgct aaatgtattc 180
 ttacatagtg cttgtatcgt tgcatttggt ttaatttggt gaaaagtatt gtatctaact 240
 tgtattactt tggtagtttc atctttatgt attattgata tttgtaattt tctcaactat 300
 aacaatgtag ttacgctaca acttgccata aacattcaaa cttgttttct tttttctggt 360
 gtittctttg ttaattcatt t 381

<210> 206

<211> 514

<212> DNA

<213> Homo sapien

<400> 206

aaaagtaaat tgcataaaat tacatccaat ttctttctct aaaccaacat attcttcacc 60
 ttacaaaagc aaacacatgg tgcactgaaa ccgaggtggt accagcttta catactgttc 120
 tgccatttgt ggggggtgca accacaacat aagtcagaaa aaaagctatc cagcttttcg 180
 tggaaatctgg tgaagtttac acttagcgat aagcctctaa gcctgaactt agcagggcta 240
 gcaaaacttt atttatttcc taactcctat tattttagaa tggttttcaa aataatactg 300
 caagttccta attgaaatac aaaacagaac aaaaagctgt gagaaatctt ttttttctt 360
 tggctcctta aagacttgga ataatttata ttagtggtgc atacatttta ccttctacat 420
 tttgatgtac ttgctcttga aagcactaga acaaattaat tgaaataaaa cctctctgaa 480
 accatttgaa tctttgatcc taccatagag tttt 514

<210> 207
<211> 522
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(522)
<223> n = A,T,C or G

<400> 207
caagctttttg gtgcatagca gccngcctgg aagcattctg agtgctctgt ctgccctggg 60
gggttttcatt atccctgtctg tcaaacaggc caccttaaat cctgcctcac tgcagtgtga 120
gttggacaaa aataatatac caacaagaag ttatgtttct tacttttata atgattcact 180
ttataccacg gactgctata cagccaaagc cagtctggct ggaactctct ctctgatgct 240
gatttgact ctgctggaat tctgcctagc tgtgctcact gctgtgctgc ggtggaaaca 300
ggcttactct gacttccttg ggagtgtact tttcctgcct cacagttaca ttggtaatc 360
tggcatgtcc tcaaaaatga ctcatgactg tggatatgaa gaactattga cttcttaaga 420
aaaaaggag aaatattaat cagaaagttg attcttatga taatatggaa aagttaacca 480
ttatagaaaa gcaaagcttg agtttcctaa atgtaagctt tt 522

<210> 208
<211> 278
<212> DNA
<213> Homo sapien

<400> 208
aaaatgcact accccttttt tccaacacgg agcttaaaac aaattaatga aagagtggaa 60
aattcaaaat aagggaaga gataaggttt tttttttttt tcctttaaga tagactcagg 120
ataggtagat agctttcact gatgtagatg tggaataaat tattacttca ggaaaaaaat 180
tcccaaacat cttatgaaaa agtatacaac tctacttcaa aatatgctat ttactcactg 240
ccaaagacag ttttatttga aatcttgttt ctgtattt 278

<210> 209
<211> 234
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(234)
<223> n = A,T,C or G

<400> 209
cctcccaaat ttagcaggtg ctgggnagga ccctagggag tggtttatgg gggctagctg 60
gtgaaactgc cctttccttt ctgttctatg agtgtgatgg tgtttgagaa aatgtggggc 120
tatggttcag gcgcacttca catgtgcaaa gatggagaaa gcactcacct acacgtttag 180
gctcagaatg ttgattgaaa cttttgaat gatcaaaaat aaaatgttat tttt 234

<210> 210
<211> 186
<212> DNA
<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(186)

<223> n = A,T,C or G

<400> 210

aaaataactg atggcaaaat aaaanattta catcacatca tactgtgtaa acatgtaagg	60
tctctgtaca aagaaatata catgcaaaat aatgtaaaaa tttaactgaa ataataaaag	120
aaacaatata caaataaaaa ttatgagggt acgaatacac atccagtttc gaatccaatt	180
tctttt	186

<210> 211

<211> 403

<212> DNA

<213> Homo sapien

<400> 211

aaaaattggt aaaatattta agtacaaaat aagtagcttc cagcgagggt tttataccat	60
agtaagagca cacaatagat attactagca cacatgggtt atctgggagc gctatagcta	120
caataaacct aattatggaa cagaaatttg cattctgttt ccagtgtctac tacactccta	180
ctttctcaaa agtctgtctt attaatatca gctcagtgtca gtttactatg aatagtttat	240
gtctgtgatg caaagcatta attgttctct ttttacaac atacattttt ttcataagga	300
agactggggg aaaacccaga aacatacaga gaaaaggaaa gcatcatcaa atatatgtta	360
aaaattaaga tgatgtttac tactagtcac cctacaacaa ttt	403

<210> 212

<211> 345

<212> DNA

<213> Homo sapien

<400> 212

cctcttttatg agttcattac tgctgttcag tctcggcaca cagacacccc tgtgcaccgg	60
gggtgtacttt ctactctgat cgctgggcct gtggttgaga taagtcacca gctacggaag	120
gtttctgacg tagaagagct taccctccca gagcatcttt ctgatcttcc accattttca	180
agggtgtttaa taggaataat aataaagtct tcgaatgtgg tcaggtcatt tttggatgaa	240
ttaaaggcat gtgtggcttc taatgatatt gaaggcattg tgtgcctcac ggctgctgtg	300
catattatcc tggttattaa tgcaggtaaa cataaaagct caaaa	345

<210> 213

<211> 318

<212> DNA

<213> Homo sapien

<400> 213

aaaatgtttt attattttga aaataatgtt gtaattcatg ccagggactg acaaaagact	60
tgagacagga tggttattct tgtcagctaa ggtcacattg tgcctttttg accttttctt	120
cctggactat tgaaatcaag cttattggat taagtgatat ttctatagcg attgaaaggg	180
caatagttaa agtaatgagc atgatgagag tttctgttaa tcatgtatta aaactgattt	240
ttagctttac aaatatgtca gtttgaggtt atgcagaatc caaagtaaat gtccctgctag	300
ctagttaagg attgtttt	318

<210> 214

<211> 462

<212> DNA

<213> Homo sapien

<400> 214

aaacacatct ggttctggca gcaagttata ttatgcattt agagcaatag gtgccctgaa	60
agttattggt gctttttttg tttttttttt cagtttgtgc gtgtcacttg aatcagaaac	120
caaacacatg taaaaaata tcacctcaa tgcccccat taactctctc tccagaagggt	180
gacaatgtta gtgaactcaa gactctcact gatgatggta ttttacaatg aaaacacaag	240
gaaacctttt gaggtccaat tttcacatca tattctccaa atagtataat agcagctcta	300
catgttgatg aaaagaaatt tcaatttctt cctatttgtt tttactcata tcaacattaa	360
tatgtatctg gatttattaa tttccaaaaa gaaaatttta gttaccaaat atttcagaaa	420
tttaataaag cattatatat atgtaattag cacttatcta cc	462

<210> 215

<211> 280

<212> DNA

<213> Homo sapien

<400> 215

aaacttttct gaaacgatta gctgtagcca aattatgtgg ttacgttttg ctacattaga	60
atttgaaaat gcaatatgtg tggtaaatct actgtttgaa atttataatg gtctctgata	120
tgattcgaat tttggttaact tttgaaagt attttccccc tttagtcatg gatttctatt	180
tgttttttaa tgtaattttt tctagaaagc atctgaattg actaggcttt tcctatataa	240
aaaactcaaa acttggttaac tctgtacttt aataaaattt	280

<210> 216

<211> 210

<212> DNA

<213> Homo sapien

<400> 216

aaaatctctg gcttcaaaagt ttcttgggga aaggctcggt tacctcacat tttttgtttc	60
cattagtaat attctaggta cctcacaaaa tgtattatgg tgccatggct gttagttttt	120
agtgaagtgt gtaggattaa ttcgaaaata ggcagaattc cattctctcc aagggtggcaa	180
aaattagcta tactgatgta attgtcattt	210

<210> 217

<211> 398

<212> DNA

<213> Homo sapien

<400> 217

ctggagctgc tagaacttga gatgagggca agagcgatta aagccctaata gaaagctggt	60
gatataaaaa agccagccta ggtatttaac ttgattttga atttttaggta tgtttgaaca	120
aagccacatc atttaatttt gtatctaaaa tttatttggg gtcttatatg ttattttctca	180
tgtaaccttt attaggactc atttttagccc taaattacct gtggctgttt ctttttattt	240
ttttgactac ttttatatta taaatgtgtg ttactgtctt atgaattcat ggcaatatag	300
ttggatagcc tggatacttt gttagatgag tatttagctg tgtctgcaaa tcttaaaagc	360
cattagcaaa gagtcgtggt atttttttct ttattttt	398

<210> 218

<211> 487

<212> DNA

<213> Homo sapien

<400> 218

ctgccgccgg tcaggctggt taaagatcag gtccccagg accttgcgat ttatgtcgcc	60
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attctccagc aagacctcag tgccgaagac ctctacgatg cgccggtggg caggggatcc 120
tggtctgacg acgtgccggg ccatacagtc cagtcacac accgcacagc ccagtttcag 180
tgtttttaca cattatattg ttataatctc acaataacta taaattaggt agaacaggaa 240
atgaggtttg gagaagatac ttgacttatc cgaccatctg tacttggtcc atagtaagga 300
gcctcaagca gagacaaagg aggaagttgc ctatgttgta tggtttacag gccataaatg 360
aatgtcatct ttttcctccc ctggggaaaa atgtctcaa aatcccacca taggacatga 420
catctccaga acctctatta caaaatacac atttctgtga gaggggtaac aaatttgggt 480
taacctg 487

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<210> 219

<211> 390

<212> DNA

<213> Homo sapien

<400> 219

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aaaaaatata ccacacgata caactcaata caggagtatt tcttctcaaa ttcttctagc 60
accatcaaca ttcttcaagt atctgaaata ctattaatta gcacctttgt attatgaaca 120
aaacaaaaca aggacctcag ttcactctctg tctaggctcag cacctaacaa tgtggatcac 180
actcatggga aagtgttttg aggtagttta aacctttgga agtttgggtt ttaaacttcc 240
ctctgtggaa gatattcaaa agccacaagt ggtgcaaattg tttatgggtt ttatttttca 300
atttttatct tggttttctt acaaagggtg acattttcca taacagggtg aagagtgttg 360
aaaaaaaaag tcaaatTTTT gggggagcgg 390

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<210> 220

<211> 341

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(341)

<223> n = A,T,C or G

<400> 220

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aaaacaggca aagttttaca gagaggatac atttaataaa actgcgagga catcaaagt 60
gtaaataactg tgaaatacct tttctnnnca aaaggcaaat attgaagttg tttatcaact 120
tcgctagaaa aaaaaaaca cttggcatatc aaaatattha agtgaaggag aagtctaacg 180
ctgaactnnn aatgaaggga aattgtttat gtgttatgaa catccaagtc tttcttcttt 240
tttaagttgt caaagaagct tccacaaaat tagaaaggac aacagttctg agctgtaatt 300
tcgccttaaa ctctggacac tctatatgta gtgcattttt a 341

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<210> 221

<211> 234

<212> DNA

<213> Homo sapien

<400> 221

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ccagggggaa ttgaggagg ctctaagcta ggggcactgc atggtgggac aggatggccc 60
cttgaggact gaaccttggg gagaagacaa acagtaataa taaaaacaaa taacaagtac 120
tttaagaatg gattgtatga cctatagtga cagatgacat cactaatact gaaagcttct 180
tatattaata attttggcaa aatgtcattt tgtaatatag tatatgcttt ccag 234

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<210> 222

<211> 186

<212> DNA

<213> Homo sapien

<400> 222

aaattttcat	tgagttgtcc	atctccagca	tatagggctt	caggagcaga	gcagaccttg	60
tttttagtgg	ttccatggga	taaaatggga	ttggaggagc	tagaagaatt	caggtctcgg	120
tccaatctgc	cagtcttcct	gaaatatcga	aaatacacca	gggctgctat	atcagagcca	180
ccctgg						186

<210> 223

<211> 486

<212> DNA

<213> Homo sapien

<400> 223

ccataagcag	ataagtagca	gttcaactgg	atgtctctct	tctccaaatg	ctacagtaca	60
aagccctaag	catgagtggg	aaatcggttc	ttcagaaaag	acttcaaata	acacttactt	120
gtgcttggt	gtgctggatg	gtatattctg	tgctattttt	cttcatggga	gaaacagccc	180
acagagctca	ccaacaagta	ctccaaaact	aagtaagagt	ttaagctttg	agatgcaaca	240
agatgagcta	atcgaaaagc	ccatgtctcc	tatgcagtac	gcacgatctg	gtctgggaac	300
agcagagatg	aatggcaaac	tcatagctgc	aggtggctat	aacagagagg	aatgtcttcg	360
aacagtcgaa	tgctataatc	cacatacaga	tcactgggtc	tttcttgcct	ccatgagaac	420
accaagagcc	cgatttcaaa	tggtgtact	catgggccag	ctctatgtgg	taggtggatc	480
aatgg						486

<210> 224

<211> 322

<212> DNA

<213> Homo sapien

<400> 224

aaatgttcac	tatgtcattt	agtgtccaac	tttacggata	ggttgactat	ctaaataggg	60
atttttagtc	attaaaaaaa	aatctagtca	ccaggaggat	ccctataact	caaaaataact	120
tgtttgtaaa	agaaaatttg	tttacttacc	cattagtaag	ttcctgcata	ttcattataa	180
gatggcaaat	caaacttttc	taggatgaag	acagcttatt	tttaagttgt	atagtcttag	240
ttggtttagg	gtctcaattt	taattaataa	aatacttggg	ttttatttgc	ttgtcccttt	300
gaattcctgt	tttaataatt	tt				322

<210> 225

<211> 489

<212> DNA

<213> Homo sapien

<400> 225

aaatgtagga	ataaaatggc	tggtcatctaa	gcacttttagt	aaaagagggt	tttacaaata	60
actaaggatt	gtagagcttc	cttctctttt	ttttctttt	tctttctttt	gttttacatg	120
aactcaactt	attcctaaca	ttgtctacc	tcaaagaaat	ttcaagatta	tttagataac	180
atggatatgt	gccaaatcct	ttgagctggt	aagatgataa	tttctgctt	tcctcctaca	240
tcttctcctc	ccactccctc	ctttggtgtg	aatattgggt	tcccaattaa	gacctttttt	300
ttttttttcc	agtttggttt	agcttattat	aggttttgga	ggaactttgc	cattttgtaa	360
tctttcaaat	cattcttcac	ccttcctcac	atcagcttcc	tgcttttccc	agtgttttac	420
tgtaaattgt	gtagcatatg	acaaatcttg	agctgacttt	cctcttcaat	gatgtcatct	480
tgaactctt						489

<210> 226

<211> 398

<212> DNA

<213> Homo sapien

<400> 226

caagggccca	ccgcagagca	cacctatgct	atggggagcc	ctgctggcag	ccccgagagc	60
catgccatgg	cctgcaggag	ccaggctcct	gtgtggatga	agtcctctct	cctctgtgcc	120
ttgatccctt	gggggtgcct	ttgggtcatct	cttctgtcct	ttcctgtctc	tgaaatagtc	180
atcactcccc	ttgactctct	ctgttcacgt	cttctcagtc	tgacagagta	acttctgtaa	240
ggagtttaat	ctgggggtcc	aagaaaacaa	gttccttgtt	aacatagcac	tgactttgca	300
acaatagaaa	actaacaat	gagcaacaat	ataaagagta	gaggtagttc	tcattgggtg	360
taacttcaac	ccattctgct	tgtggttaga	atttataa			398

<210> 227

<211> 535

<212> DNA

<213> Homo sapien

<400> 227

ctgctgcata	gaaaatatgc	taacatacaa	cagtcaagtt	taagcctgtg	catagagaag	60
ataaagcact	tatggtaact	gcaaatggta	acgagtcctt	aaggtttgta	caacctagta	120
tgggtccata	aggaaaaact	gtagtagaaa	tggttaggac	aaacaataaa	gtagaaacag	180
gggggaaaact	tgagaagaga	agaaagaagc	aagaaaaaaa	gactttcaat	tgtataaaat	240
tcacaaacca	gtaaagtata	aagacaccat	ggagaaatgg	ttaactctgc	cccaaacc	300
caacagcaaa	caaaaccaga	atgaataagc	ctttggcaga	caattttaga	aatttgaatg	360
ttacatttct	caataattca	caaacaatat	attatatggt	atatttatat	taaatattgg	420
gaaaccaatg	ttgtaaattt	gatgcttata	atgctttagc	caatgagagc	acaatgatat	480
caatcaagct	aaatgaatgc	tgggtttatc	acaacagtgc	tcattttatga	aacaa	535

<210> 228

<211> 301

<212> DNA

<213> Homo sapien

<400> 228

aaacaataaa	caccatcaac	cttattgact	ttattgtccc	tcaaattata	ttgactgttg	60
tgattccatc	aagtttgtac	actcttttct	ctccctgttt	tgacagcaaca	aattgcgaag	120
tgcttttgtt	tgtttgtttt	cgtttggtta	aagcttattg	ccatgctggt	gcggctatgg	180
agactgtctg	gaaggcttgg	aatggtttat	tgcttatggt	aaaatttgcc	tgatttctta	240
caggcagcgt	ttggaaacct	tttatttat	agttgtttac	atacttataa	gtctatcatt	300
t						301

<210> 229

<211> 420

<212> DNA

<213> Homo sapien

<400> 229

aaagtgtgctt	tgctggaagt	ttttataagg	aatctcagat	taaaccttta	gaagttaaat	60
tgactactagg	aagccaaacc	aaggctgact	tcagactttg	ttttagtagac	ctgtgggttt	120
attacctatg	ggtttatatc	ctcaaatagc	acattctagt	caaagtcttg	gtaatatatac	180
caatgttttc	aaatgtatc	tgtcatacaa	agagcagatt	tttattgaac	ttgtgcaata	240
actatattac	catacaatat	aatatttc	gaatagtttc	ccaagtctgg	agcgaccaca	300
tagggagaaa	atgcaaatgt	ctcaattttt	gttcacaaaa	gtatatattta	tcaaatgtct	360
gtaagctgtg	gatagcttaa	aagaaaaaaa	gtttcctgaa	atctgggaaa	caagacattt	420

<210> 230
 <211> 419
 <212> DNA
 <213> Homo sapien

<400> 230
 gtgaagtcct aaagcttgca ttccaccagc ttctacaata gccggccttat tactagagca 60
 gacagatagc accttcagca ctctgcttgt ggtccacagt agtttttcgt aagtataggt 120
 cctcattata ttactaaaag cttgggggtcc accactagcc agtatgatga gcttgctttc 180
 ttggttgcca taagctaaaa ttgaaggca gtctgtcgta atagccaaga atttaacatt 240
 tgttttgttg agcaaggcaa ccattttctg cagcccacca gctaaacgca ctgccathtt 300
 agtccttct tgatgtaata aaaggttgtg gagagttgta atggcataaa acaacacaga 360
 atccactggg gaaccaagca ttttcaccag ggcaggaatg cctccagact taaagatgg 419

<210> 231
 <211> 389
 <212> DNA
 <213> Homo sapien

<400> 231
 ttgttcagag ccctgggtgga tcttgcaatc cagtgcctta caaaggctag aacactacag 60
 gggatgaatt cttcaaatag gagccgatgg atctgtggtc ctttgggact catcaaagcc 120
 ttggtttagc attttgtcag ttttatcttc agaaattctc tgcgattaag aagataatht 180
 attaaagggt gtcttctcta cctctgtggt gtgtgtcgcg cacacagctt agaagtgcta 240
 taaaaaagga aagagctcca aattgaatca cttttataat ttaccattt ctatacaaca 300
 ggcagtggaa gcagtttcag agaacttttt gcattgcttat ggttgatcag ttaaaaaaga 360
 atgttacagt aacaaataaa gtgcagttt 399

<210> 232
 <211> 397
 <212> DNA
 <213> Homo sapien

<400> 232
 ccaggataat atacacaggt ttgcagctaa aactgtgcac agtgggtcat tgatgctagt 60
 cacagtggaa ctgaaggaag gctctacagc ccagcttatc ataaacactg agaaaactgt 120
 gattggctct gttctgctgc ggaactgaa gcctgtcctg tctcaggggt aacctgctta 180
 catctggact ttagaatctg gcacacaaca aaagtgccctg gcattccacta ctgctgcctt 240
 tcatattataa taatagccct tccatctggc agtgggggaa gaatacactc ttgacattct 300
 tgtctcctgc tttagaatgc tagtgtgtat ctatcatgta tgcaatactt tccccctttt 360
 tgctttgcta accaaagagc atatatttta ctgtcag 397

<210> 233
 <211> 508
 <212> DNA
 <213> Homo sapien

<400> 233
 cgaggagtcg cttaagtgcg aggacctcaa agtgggacaa tatatttgta aagatccaaa 60
 aataaatgac gctacgcaag aaccagttaa ctgtacaaac tacacagctc atgtttcctg 120
 ttttcagca cccaacataa cttgtaagga ttccagtggc aatgaaacac attttactgg 180
 gaacgaagtt ggttttttca agcccatatc ttgccgaaat gtaaatggct attcctacaa 240
 agtggcagtc gcattgtctc tttttcttgg atggttggga gcagatcgat ttaccttgg 300
 ataccctgct ttgggtttgt taaagttttg cactgtaggg ttttgggaa ttgggagcct 360
 aattgatttc attcttattt caatgcagat tgttggacct tcagatggaa gtatttacat 420

tatagattac tatggaacca gacttacaag actgagtatt actaatgaaa catttagaaa 480
aacgcaatta tatccataaa tattttttt 508

<210> 234
<211> 358
<212> DNA
<213> Homo sapien

<400> 234
aaatgttggg attcaaaacc aaagatatataa ccgaaaggaa aaacagatga gacataaaat 60
gatttgcaag atgggaaata tagtagttta tgaatgtaaa ttaaattcca gttataatag 120
tggctacaca ctctcactac acacacagac cccacagtcc tatatgccac aaacacattt 180
ccataacttg aaaatgagta ttttgcatac ctacagttcag gatatgtttt ttacaagtta 240
atcctaaagt cataaagcaa gaagctattc atagtacaag attttatttg ctaagcttta 300
caaattaaac tctaaaaaat tattacaatg atactgaaag atattttatt ggcctttt 358

<210> 235
<211> 482
<212> DNA
<213> Homo sapien

<400> 235
gaagaaagt agatttacgc cgatgaatat gatagtgaag tggatttttg cgtaggtttg 60
gtctaggggtg tagcctgaga ataggggaaa tcagtgaatg aagcctccta tgaaggcaaa 120
tacagctcct attgatagga catagtggaa gtgagctaca acgtagtacg tgcgtgtag 180
tacgatgtct agtgatgagt ttgctaatac aatgccagtc aggccaccta cggtgaaaag 240
aaagatgaat cctagggctc agagcactgc agcagatcat ttcataattgc ttccgtggag 300
tgtggcgagt cagctaaata ctttgacgcc ggtggggata gcgatgatta tggtagcggg 360
ggtgaaatat gctcgtgtgt ctacgtctat tcctactgta aatatatggt gtgctcacac 420
gataaacctt aggaagccaa ttgatcatat agctcagacc atacctatgt atccaaatgg 480
tt 482

<210> 236
<211> 149
<212> DNA
<213> Homo sapien

<400> 236
cctcttcatt gttcacatgt cacaggagga ggctctgagc aaaggccact ggcaagttag 60
ggcaacacca agaaggctct gcggagagac tcctgtggg ttggggcctg gcaggaacgg 120
tgctgtgga ctgtttatgg tctgtccag 149

<210> 237
<211> 391
<212> DNA
<213> Homo sapien

<400> 237
gaagctaaat ccaaagaaat atgaaggtgg ccgtgaatta agtgatttta ttagctatct 60
acaaagagaa gctacaaacc ccctgtaat tcaagaagaa aaacccaaga agaagaagaa 120
ggcacaggag gatctctaaa gcagtagcca aacaccactt tgtaaaagga ctcttccatc 180
agagatggga aaaccatttg ggaggactag gaccatattg ggaattatta cctctcaggg 240
ccgagaggac agaattggata taatctgaat cctgttaaatt tttctctaaa ctgtttctta 300
gctgcaactgt ttatggaaat accaggacca gtttatgttt gtggttttgg gaaaaattat 360
ttgtgttggg ggaaatgttg tgggggtggg g 391

<210> 238
 <211> 374
 <212> DNA
 <213> Homo sapien

<400> 238
 aaaaaacaaa acaatgtaag taaaggatat ttctgaatct taaaattcat cccatgtgtg 60
 atcataaact cataaaaaata attttaagat gccggaaaag gatactttga ttaaataaaa 120
 acactcatgg atatgtaaaa actgtcaaga ttaaaattta atagtttcat ttatttgta 180
 ttttatttgt aagaaatagt gatgaacaaa gatccttttt catactgata cctggttgta 240
 tattatttga tgcaacagtt ttctgaaatg atatttcaa ttgcatcaag aaattaaaat 300
 catctatctg agtagtcaaa atacaagtaa aggagagcaa ataaacaaca tttggaaaaa 360
 aaaaaaaaaa aaaa 374

<210> 239
 <211> 200
 <212> DNA
 <213> Homo sapien

<400> 239
 aaagatgtct ttgaccgcat atgtactgga aatttcaaac gtggatcttc ccaggttgta 60
 gtcttttgtt tatgatcaat gaagaagggc cggccggttg gcgctatcct catttcccag 120
 ccgggtggca agaagctctg tgtgactttg tgttgtgggt tgggggaggt gtaaggtgat 180
 ggctgtgggg actgtgggtt 200

<210> 240
 <211> 314
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(314)
 <223> n = A,T,C or G

<400> 240
 ctggtaaact gtccaaaaca aggttccaaa taacacctct tactgattta ccctacccat 60
 acatatncca natagntttt gatcaaaaac atgaaatana tccacctgct tattttaagc 120
 atattaaaaa ggaaactaat tggaccattt tctatttgtc tattttatac aaaaaggcta 180
 cacaattgat aactctatt cagataacaa tcaattagag tgantatgaa ttactggcga 240
 caccatcact caattcttaa aaattagaaa ttgctgtagc agtattcact ataacttaac 300
 actaccgaga gact 314

<210> 241
 <211> 375
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(375)
 <223> n = A,T,C or G

<400> 241

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ccaagtcctt ggagttatag gatattcatt acttccctctc attgtaatag cccctgtact      60
tttggtgggt ggatcatttg aagtgggtgc tacacttata aaactgtttg gtgtgttttg      120
ggctgcctac agtgcctgctt cattgttagt ggggtgaagaa ttcaagacca aaaagcctct      180
tctgatttat ccaatctttt tattatacat ttatcttttg tcgttatata ctggtgtgtg      240
atccaagtta tacatgaata gaaaaagatg gtgttaaatt tgtgtgtagg ctgggaattc      300
tngctaaagg aatggnaaaa aacctgtntt tgnaaaattn acntgtccca aagnnaagga      360
anctaaacgc ttttt                                     375

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<210> 242

<211> 387

<212> DNA

<213> Homo sapien

<400> 242

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aaaggcattc tctgatttac atgagaattg agaaaactgag atgtatgatt tgtctgttag      60
tcaatttcac accctttcat tctcataagc cccaaatttt gctcagttaa ggagcttgct      120
ttagggccac ctatgtaagt ctgttatact agctaattgtg cccatttgaa tagttcaagg      180
gtcagctaatt gctctgagct tcatggctcc agtataaaga acaaatttaa caaaattaag      240
ctgttactgt agccgagtta cccttctgct ccacacatat gtagtgggat cttgcaggat      300
ttccatagtg ccaattatca aaggccttga ctacttagca ttgctgtatt acagatgtgc      360
aaactgaggc actgaaaagt caaattt                                     387

```

<210> 243

<211> 536

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(536)

<223> n = A,T,C or G

<400> 243

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aaacccaaag gacgaagaaa aaacactttn aaaaaaaaaa aaaaaaaaga aaaaccaaac      60
catattttgc cacatgtgag agtacggtca agcagtatatt aaaaaaagg taacggaaca      120
acactctgac acatgctctg agaatactgg gactgctgtt tcaaaaaaa aggttcaaac      180
ttattgtcac agcatcatca caaaatagag gatcaccatt ggtttgcttg gcttttcttt      240
ttttttttcc cccaagttag gacctaactc caaataatac aatagaatat gcaaattatc      300
ttcacatcaa gagtacccca agaaaaacga aatccatggc acanacactg tacaaggggtg      360
cagggcaggg ctctgagggg cccaaacccc attttgccaa ctcgattttc tagcattgaa      420
gggagcaagg ggtcaggcat atgatggaga tgatactgaa atgatttata caaaatccat      480
gcaaatcaag ttctttggat agaggtgaan aacttggaac tggctgtttc aggcag      536

```

<210> 244

<211> 397

<212> DNA

<213> Homo sapien

<400> 244

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ccaggataat atacacaggt ttgcagctaa aactgtgcac agtgggtcat tgatgctagt      60
cacagtggaa ctgaagggaag gctctacagc ccagcttata ataaacactg agaaaactgt      120
gattggctct gttctgctgc gggaaactgaa gcctgtcctg tctcaggggt aacctgctta      180
catctggact ttagaatctg gcacacaaca aaagtgcctg gcattccacta ctgctgcctt      240
tcatttataa taatagccct tccatctggc agtgggggaa gaatacactc ttgacattct      300
tgtctcctgc tttagaatgc tagtgtgtat ctatcatgta tgcaatactt tccccctttt      360

```

tgctttgcta accaaagagc atatatttta ctgtcag

397

<210> 245
 <211> 508
 <212> DNA
 <213> Homo sapien

<400> 245

cgaggagtcg	cttaagtgcg	aggacctcaa	agtgggacaa	tatatttgta	aagatccaaa	60
aataaatgac	gctacgcaag	aaccagttaa	ctgtacaaac	tacacagctc	atgtttcctg	120
ttttccagca	cccaacataa	cttgtaagga	ttccagtggc	aatgaaacac	attttactgg	180
gaacgaagtt	ggttttttca	agcccatatc	ttgccgaaat	gtaaatggct	attcctacaa	240
agtggcagtc	gcattgtctc	tttttcttgg	atggttggga	gcagatcgat	tttaccttgg	300
ataccctgct	ttgggtttgt	taaagttttg	cactgtaggg	ttttgtggaa	ttgggagcct	360
aattgatttc	attcttattt	caatgcagat	tgttggacct	tcagatggaa	gtagttacat	420
tatagattac	tatggaacca	gacttacaag	actgagtatt	actaatgaaa	catttagaaa	480
aacgcaatta	tatccataaa	tatttttt				508

<210> 246
 <211> 358
 <212> DNA
 <213> Homo sapien

<400> 246

aaatgttggt	attcaaaacc	aaagatatata	ccgaaaggaa	aaacagatga	gacataaaat	60
gatttgcaag	atgggaaata	tagtagttta	tgaatgtaaa	ttaaattcca	gttataatag	120
tggctacaca	ctctcactac	acacacagac	cccacagtcc	tatatgccac	aaacacattt	180
ccataacttg	aaaatgagta	ttttgcataat	ctcagttcag	gatatgtttt	ttacaagtta	240
atcctaaggt	cataaagcaa	gaagctattc	atagtacaag	attttatttg	ctaagcttta	300
caaattaaac	tctaaaaaat	tattacaatg	atactgaaag	atattttatt	ggcctttt	358

<210> 247
 <211> 673
 <212> DNA
 <213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(673)

<223> n = A,T,C or G

<400> 247

gaagaaagtt	agattttacgc	cgatgaatat	gatagtgaag	tggatttttg	cgtaggtttg	60
gtctaggggtg	tagcctgaga	ataggggaaa	tcagtgaatg	aagcctccta	tgatggcaaa	120
tacagctcct	attgatagga	catagtggaa	gtgagctaca	acgtagtacg	tgctcgttag	180
tacgatgtct	agtgatgagt	ttgctaatac	aatgccagtc	aggccaccta	cggtgaaaag	240
aaagatgaat	cctagggctc	agagcactgc	agcagatcat	ttcatattgc	ttccgtggag	300
tgtggcgagt	cagctaaata	ctttgacgcc	ggtggggata	gcgatgatta	tggtagcgga	360
ggtgaaatat	gctcgtgtgt	ctacgtctat	tcctactgta	aatatatggt	gtgctcacac	420
gataaaccct	aggaagccaa	ttgatatcat	agctcagacc	atacctatgt	atccaaatgg	480
ttcttttttt	ccggagttagt	aagttacaat	atgggagatt	attccgaagc	ctggtaggat	540
aagaatataa	acttcagggt	gaccgaaaaa	tcagaatagg	tggttggtata	gaatggggtc	600
tcctnctccg	cggggtcnaa	gaaggtggtg	ttgangttgc	cggnctgtta	ntagtatagn	660
gatgccanca	gct					673

<210> 248
 <211> 149
 <212> DNA
 <213> Homo sapien

<400> 248
 cctcttcatt gttcacatgt cacaggagga ggctctgagc aaaggccact ggcaagttag 60
 ggcaacacca agaaggctct gcggagagac tccctgtggg ttggggcctg gcaggaacgg 120
 tgcctgtgga ctgtttatgg tctgtccag 149

<210> 249
 <211> 458
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(458)
 <223> n = A,T,C or G

<400> 249
 gaagctaaat ccaaagaaat atgaaggtgg ccgtgaatta agtgatttta ttagctatct 60
 acaaagagaa gctacaaacc cccctgtaat tcaagaagaa aaaccaaga agaagaagaa 120
 ggcacaggag gatctctaaa gcagtagcca aacaccactt tgtaaaagga ctcttccatc 180
 agagatggga aaaccattgg ggaggactag gaccatattg ggaattatta cctctcaggg 240
 ccgagaggac agaattggata taatctgaat cctgttaaat tttctctaaa ctgtttctta 300
 gctgcactgt ttatggaaat accaggacca gtttatgttt gtggttttgg gaaaaattat 360
 ttgtgttggg ggaaatgttg tgggggtggg gttgagttgg gggtatcttc taattttttt 420
 tgtacatttg gaacagtgc aataaatgan accccttt 458

<210> 250
 <211> 374
 <212> DNA
 <213> Homo sapien

<400> 250
 aaaaaacaaa acaatgtaag taaaggatat ttctgaatct taaaattcat cccatgtgtg 60
 atcataaact cataaaaaata attttaagat gccggaaaag gatactttga ttaaataaaa 120
 acactcatgg atatgtaaaa actgtcaaga ttaaaattta atagtttcat ttatttgta 180
 ttttatttgt aagaaatagt gatgaacaaa gatccttttt catactgata cctggttgta 240
 tattatttga tgcaacagtt ttctgaaatg atatttcaaa ttgcatcaag aaattaaaat 300
 catctatctg agtagtcaaa atacaagtaa aggagagcaa ataaacaaca tttggaaaaa 360
 aaaaaaaaaa aaaa 374

<210> 251
 <211> 356
 <212> DNA
 <213> Homo sapien

<400> 251
 aaagatcttc tctaacaagc tatgggaatt tggcttcata ctctttcttt gcaacagcag 60
 tgttctgggt gataattttg aattgatacc tgttcctttt tctgggtttt gttggctttt 120
 tgaaaaattg tctttcctta tcattgggtg gaggttgggt agcaaagtaa catttttttg 180
 aaaaggaggac agaaaaattg aactacagct tgagaacgta ttcttttttt cctactttgt 240
 tattgcaaat tgaggaaatca cttttaactg ttttaggtgt gtgtgtccag agtgagcaag 300

gattatgttt ttggattgtc aaagaggatg cttagtctta aaataaaaat aaattt 356

<210> 252

<211> 484

<212> DNA

<213> Homo sapien

<400> 252

ctggtaaact	gtccaaaaca	aggttccaaa	taacacctct	tactgattta	ccctacccat	60
acatatccca	aatagttttt	gatcaaaaac	atgaaataga	tccacctgct	tattttaagc	120
atattaaaaa	ggaaactaat	tggaaccattt	tctatttgtc	tattttatac	aaaaaggcta	180
cacaattggt	acactttatt	cagattacaa	ttaattagag	tgattatgaa	ttagtggtct	240
acaccattac	tcaattctta	aaaattagaa	attgctgtag	cagtattcac	tataacttaa	300
cactacgaga	gacttaaaaa	acagttactg	caaaaaaaaa	aaagagctac	ttcaaagcaa	360
gcaaagtcag	taccattaca	gatattctta	aaaaaaaaaa	aaaatttaac	aagcaaggct	420
agggtttgat	aaattccatc	ttgtgatcca	ttcttgtgca	ttcttcactt	cttgagtcac	480
tccc						484

<210> 253

<211> 379

<212> DNA

<213> Homo sapien

<400> 253

aaaaagcgct	tagacttccc	tttccatctg	gaacatgtaa	aattttgcag	caacagggtt	60
tctccaattc	cttcagcaag	aattcccagc	ctacacacaa	atttaacacc	atctttttct	120
attcatgtat	aacttggtat	acacaccagt	atataacgac	aaaagataaa	tgtataataa	180
aaagattgga	taaatcagaa	gaggcttttt	ggtcttgaat	tcttcaccca	ctaacaatga	240
agcagcactg	taggcagccc	aaaacacacc	aaacagtttt	ataagtgtag	acaccacttc	300
aatgatcca	accaccaaaa	gtacaggggc	tattacaatg	agaggaagta	atgaatatcc	360
tataactcca	aggacttgg					379

<210> 254

<211> 387

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(387)

<223> n = A,T,C or G

<400> 254

aaatttgact	tttcagtgcc	tcagtttgca	catctgtaat	acagcaatgc	taagtagtca	60
aggccnttga	taattggcac	tatggaaatc	ctgcaagatc	ccactacata	tgtgtggagc	120
agaagggtaa	ctcggctaca	gtaacagctt	aattttgtta	aatttgttct	ttatactgga	180
gccatgaagc	tcagagcatt	agctgacctt	tgaactattc	aaatgggcac	attagctagt	240
ataacagact	tacataggtg	ggcctaaagc	aagctcctta	actgagcaaa	atttggggct	300
tatgagaatg	aaagggtgtg	aaattgacta	acagacaaat	catacatctc	agtttctcaa	360
ttctcatgta	aatcagagaa	tgccttt				387

<210> 255

<211> 225

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(225)

<223> n = A,T,C or G

<400> 255

aaatgtcttg	tttcccagat	ttcaggaaan	tttttttctt	ttaagctatc	cacagcttac	60
agcacctttg	ataaaatata	cttttgtgaa	caaaaattga	gacatttaca	ttttctccct	120
atgtggtcgc	tccagacttg	ggaaactatt	catgaatatt	tatattgtat	ggtaatatag	180
ttattgcaca	agttcaataa	aaatctgctc	tttgatgac	agaat		225

<210> 256

<211> 544

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(544)

<223> n = A,T,C or G

<400> 256

ccttgcttaa	agcccagaag	tggttttaggc	ntttggaaaa	tctgggtcac	atcataaaga	60
acttgatttg	aaatgttttc	tatagaaaca	agtgctaagt	gtaccgtatt	atacttgatg	120
ttggtcattt	ctcagtccta	tttctcagtt	ctattatttl	agaacctagt	cagttcttta	180
agattataac	tggtcctaca	ttaaaataat	gcttctcgat	gtcagatttt	acctgtttgc	240
tgctgagaac	atctctgcct	aattttacaa	agccagacct	tcagttcaac	atgcttcctt	300
agcttttcat	agttgtctga	catttccatg	aaaacaaagg	aaccaacttt	gttttaacca	360
aactttgttt	ggttacagtt	ttcaggggag	cgtttcttcc	atgacacaca	gcaacatccc	420
aaagaaataa	acaagtgtga	caaanaaaaa	aacaaaccta	aatgctactg	ttccaaagag	480
caacttgatg	gtttttttta	atactgagtg	caaaaggnc	cccaaattcc	tatgatgaaa	540
tttt						544

<210> 257

<211> 420

<212> DNA

<213> Homo sapien

<400> 257

aaatgtcttg	tttcccagat	ttcaggaaac	tttttttctt	ttaagctatc	cacagcttac	60
agcaatttga	taaaatatac	ttttgtgaac	aaaaattgag	acattttacat	tttctcccta	120
tggtggtcgc	ccagacttgg	gaaactattc	atgaatattt	atattgtatg	gtaatatagt	180
tattgcacaa	gttcaataaa	aatctgctct	ttgtatgaca	gaatacattt	gaaaacattg	240
gttatattac	caagactttg	actagaatgt	cgtatttgag	gatataaacc	cataggtaat	300
aaaccacag	gtactacaaa	caaagtctga	agtcagcctt	ggtttggctt	cctagtgtca	360
attaaacttc	taaaagttta	atctgagatt	ccttataaaa	acttcagca	aagcaacttt	420

<210> 258

<211> 736

<212> DNA

<213> Homo sapien

<400> 258

aaacaaaatg	ctaaacctaa	aaacattggt	ctgtcagttc	ccaaattaaa	tctacttaga	60
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acaaaaacaa aaatttatag ctcggtcaca tactacttaa ataattttgt tcaggcatct 120
ctaaaatcct ccatgttttc aagtatggaa atagaactca aatattccac aatacagtac 180
taaacagatg gagtatattg gaaagacttt gttgtcatat ggcacaatat taatattttg 240
ttgcttcaat acgttttgaa ataaatatca gatttttggt tttttttcct aaaagaccaa 300
aattataatc tacattaaga taattctgac tgtgggtaag acttaagagt gtaaaatata 360
acatcaatat tttatcacia aagtaaagct ggtaacaaat tataaaagga gccagtactc 420
tactgagaca ggctcggaga ttaaagctca tcatgataga aatagtcac atggagctgt 480
ctgccataat ctgtggcttc actggtgaga aacaagtcg gggtttccag aatctcttct 540
tcagagagct tttgtcacc attcaaacc atttcatcaa ttagatgaag cgcctcctct 600
tgtgcaatgc cctgattatt aggtctaccc aaggtaacag ctcttgggga tcaagcctgc 660
catcgttatc tttgtcataa tcattcaccc aatctgtctt tctcacaagt atcccattct 720
ggatcttcat ttgcag 736

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<210> 259

<211> 437

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(437)

<223> n = A,T,C or G

<400> 259

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aaaaccatag tgaaatcatt taccaaataa cnaagatctt aatctaaaag atagtgaata 60
catcatcatc atgaaatctg gttttatgtg ctctatgaag tacttgagga attgcttttt 120
tatttttctt ttgctttatt aggtcacaca aaacagaatg aattagcaga aaaatgtatg 180
ttataaaaca gcatttacta ctccaattta atttttttta ctaacaattg tggacctttt 240
tgatgacact tatgtatgtt ttaataaat tatgtactta ttagtactta atgagccctt 300
cctgcctcaa tataaaatta cttaacttgg agaattacag attttattgt aggccttgat 360
gttagtcact ttggagaagc taaaaatttg gaaatgatgt aattcccact gtaatagcat 420
agggattttg gaagcag 437

```

<210> 260

<211> 592

<212> DNA

<213> Homo sapien

<400> 260

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tttttttttt gaaaaatata aaattttaat aaaggctaca tctcttaatt acaataatta 60
ttgtaccaag taattttcct taaatgaact ctttataatg cataatttac agtataagta 120
gaacaaaatg tcatgacaaa agtcattgag tacaagactt gtaataaaaa ggcataaaat 180
atattttata ataaaccctt ttcaaaaaac aagggaagc ttgagccctc aatatagggc 240
gacacacgga gcgggtgacc gtgcaggtag aggtactgta ctgattttaa gtcaagcact 300
agagatagtg gattaatact cttttgccgt acactatata cagatgtata gtacaagtaa 360
caatggcaaa cagaatgtac agattaactt aacacaaaaa cccgaacatc aaaatgaagg 420
tgtgtggagg aaagggtgct ctgggtctcc ctacaactgt tcatttcttt gtggggcagg 480
gggtagttcc tgaatggctg tgggtccaat actaatgtaa aacaaaaaca gaaacaaaaa 540
aaacaaggaa ctgtcatttc cacgaaagca cagcggcagt gattctagca gg 592

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<210> 261

<211> 450

<212> DNA

<213> Homo sapien

<400> 261

gtggcagggc	ccagccccga	accagacaag	ggacccctca	aggagcttca	ttctagcatg	60
agaaaattga	gaagtaaacc	agaaagtac	agaatgtctg	aaggggacag	tgtgggagaa	120
tccgtccatg	ggaaaccttc	ggtggtgtac	agatttttca	caagacttgg	acagatttat	180
cagtcctggc	tagacaagtc	cacaccctac	acggctgtgc	gatgggtcgt	gacactgggc	240
ctgagctttg	tctacatgat	tcgagtttac	ctgctgcagg	gttggtacat	tgtgacctat	300
gccttgggga	tctaccatct	aaatcttttc	atagcttttc	tttctcccaa	agtggatcct	360
tccttaatgg	aagactcaga	tgacggctct	tcgctaccca	ccaaacagaa	cgaggaattc	420
cgccccctca	ttcgaaggct	cccagagttt				450

<210> 262

<211> 239

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(239)

<223> n = A,T,C or G

<400> 262

taactttgat	gacaaaatct	aaaattaaag	anttagtctt	aaaagcctat	agtgacttgt	60
ttacttgc	aaataatatt	ttcacttagt	acaggctatt	aatataagta	atgagaattt	120
aagtattaac	tcaaaaaaag	atagaggctc	caaacttttc	taagaaatta	atgcattttc	180
aaagtaataa	tataatcaat	ctgtgaagtc	aaagtaattt	catattcatt	gccaaattt	239

<210> 263

<211> 376

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(376)

<223> n = A,T,C or G

<400> 263

aaaaaaaaaa	aaaaaaaaatt	ccttgtngtt	tnntagagga	aaaaaagaaa	aaccccaact	60
tttancactg	atactacata	ttgctctggt	aaagaatttt	ctctgccaaa	aaaaagaaaa	120
aacaaaaaaa	cgcttaaagc	tgaggtttga	cattctgctt	tcagatgctg	tctttttatt	180
agtgagtgat	gatgggttgc	taataatcaa	taggtaataa	ttttttgtaa	tcccatcaag	240
tggtctcata	tgtttctgct	ctctcgtgac	tgtgttaatg	tttaactggt	gtaccttaaa	300
gccgaaatca	gtaactatgc	atactgtaac	caaggtattg	ggcttacaga	gttggttggt	360
gnataaagaa	aattttt					376

<210> 264

<211> 207

<212> DNA

<213> Homo sapien

<400> 264

aaattagcat	tccacaaata	tacaggtaat	ttaataatta	ttgtgcatga	atacatacac	60
aatgcttata	tatacaaatt	ccagtttggt	ttcatgtgct	ggcaagggat	ttgtatacaa	120
tcataagctg	tgttcatatt	ggccccattg	aatattcaca	atacaaaagc	acaaaagaac	180
cattgattta	caaaaggaaa	tctattt				207

<210> 265
 <211> 388
 <212> DNA
 <213> Homo sapien

 <220>
 <221> misc_feature
 <222> (1)...(388)
 <223> n = A,T,C or G

<400> 265
 naactgcact ttatttggtta ctgtaacatt nttttttaac tgatcaacca taagcatgca 60
 aaagncnct gaaactgctt ccaactgcctg ttgtatagaa atgggtaaat tataaagggtg 120
 attcaatttg gagctccttc cttttttata gcacttctaa gctgtgtgcg cgacacacac 180
 cacagaggta ggaaggacca cttttaataa attatcttct taatcgcaga gaatttctga 240
 agataaaact gacaaaatgc taaaccaagg ctttgatgag tcccaaagga ccacagatcc 300
 atcggctcct atttgaagaa ttcattccct gtagtggtct agcctttgta gggcactgga 360
 ttacaagatc caccagggtc ctgaacaa 388

<210> 266
 <211> 616
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(616)
 <223> n = A,T,C or G

<400> 266
 aaatacagag tcaaaagatg atttataaaa tntaaaacat tttctgcttg gccgtatttg 60
 aagacaagct gaatacatat ctatgttctg aataagtcca ctatggatat atataggaag 120
 agatatacat atatccatcc acagatacac acacacatat atatttctgc atgtatatat 180
 acataattct ttctatagtt acaggaaata cttcttctat aattctgatt ttgactccca 240
 tctccacca tttactcacc cactcattac ctaaactctg gctttcttcc ctatattgta 300
 aataatccat ccaaacttct agccagtact gtcaggaggg ttcttgctcg agtgagctgt 360
 taatactatt ttccactgac aacttctgca catcgaggac acagtgtatc tgaagactcc 420
 gctgtatact tccaacaacg ggggcatttt tctttcgtag tcggcatgac aattacttta 480
 taggaagact cttcacgaat atcaccacct tctaagttga tgaggaaatt ccctttaagc 540
 tcgattacat ctgcagtcac ctctcgtggt tcctgaccag taaagttgac tcagaagcca 600
 tcattaattc attcaa 616

<210> 267
 <211> 341
 <212> DNA
 <213> Homo sapien

<400> 267
 ccattatgta tgtattttct tgaaaaatac ttatttcagc tacttatttt taatagttac 60
 ttattcttgt tgtattgtca tttgagtttt gtatatattt ttgatattaa ccccttgta 120
 catgtataat ttgcaaatat tttctccctt tttttagttg tcacattctg ttcattgtat 180
 cagattctgt gcagcagctt ttttaattga agtgatctga ctgacttggt cttccttttg 240
 tgtcctggga tatttaggtt aaatcaaaaa acttgctgcc cagaccaatg ttatgggggt 300
 ttcactctat tttttggtag tagtagttta agagttttag g 341

<210> 268
 <211> 367
 <212> DNA
 <213> Homo sapien
 <220>
 <221> misc_feature
 <222> (1)...(367)
 <223> n = A,T,C or G

<400> 268
 ttgtagattg gaatagcaaa agtgaatgct ntgacaaaaa tttttgccct cctaaataaa 60
 gacgtntcct tctagagagc aaatctatca taaaatgtca aaactagaag agaataaaat 120
 gaaaggaaaa aacctagaaa aatatacctaa aatatcaaat gcagtcattt ctaaataataa 180
 gccataatta tagctttacc tattgttctt attgttccta tgctgcttct acaatgttac 240
 atcaactata cttagcttta ctctcccaaa atcttgggtga tgaagccttc tgagtgtgct 300
 ttccaartgt ccagaaccag aagggcattc caaggcttcc ccacatttcc tccatttacg 360
 gagacag 367

<210> 269
 <211> 270
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(270)
 <223> n = A,T,C or G

<400> 269
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 gnaangengn tgagggtgat taaaccaaac ccagctacgc aaaatcttag catactcctc 120
 aattaccac ataggatgaa taatagcagt tctaccgtac aaccctaaca taaccattct 180
 taatttaact atttatatta tcctaactac taccgcatcc ctactactca acttaaactc 240
 cagcaccacg accctactac tatntcgac 270

<210> 270
 <211> 368
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(368)
 <223> n = A,T,C or G

<400> 270
 ctgaatcatg aataacacta tataatagag tntaaggaac acaagcatta gatgtgatcc 60
 ttgccccata cccttagatt atgtcagact aaagctgaca attctgccag gctctgaacc 120
 cctagtgcc ccaaccctaaa tcttgggaagc aaagaatatg ccctgtcata caactttgta 180
 caagttgtag taaaacaaag cttaagtttt ctcatcttcc tacagcaaag ggtagttat 240
 ttaataaaca ctaaaatgct cctaagaatc ctttttgagt ttgtttacca aacacattgt 300
 gcaagaactg actacacaaa aagtttcctt gaaatttggt ccacaaattc acttaaggtt 360
 ggaaattt 368

<210> 271
 <211> 313
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(313)
 <223> n = A,T,C or G

<400> 271
 aaatttatat aaaactctgt acatgttcac tttattattg cataaacagc ataatcttca 60
 agacaanngt ttgcaaacac atgtccaatt caggaaaaaa aatttcacgt ttctcgtctg 120
 gcttttttct tcttttttat ttgtttggga gattcccagc tagtttcaga cttgggtctg 180
 gaaggaggca cactattttg cttggtattt gacttggatt tatctgtctc ttgtagtatt 240
 ggcggcactt gggaagagct cttgtcagaa tcactttttg ataagattac agatggctcg 300
 gtagaagtag cag 313

<210> 272
 <211> 462
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(462)
 <223> n = A,T,C or G

<400> 272
 aaaaaacatt tattttaata agactattgc naacacatta aaaaaactaa atagtaatat 60
 tacaaaatct atatacttgc acatttagta tttgtcaatg tgccagaggt tttcttcag 120
 aaatttgact tctttgaagt gaaggctttt ttctatcatc tcttatagct ctgactgaat 180
 aagtcttaat gctttcttca tgttttctat caataggggt aaatcccag gctcatatgt 240
 gtacaatctg ttagagtatc ttccagctat gtcagctcta actgttaaag aagggtctac 300
 aaacatgatt ctaggcacat attgccatc aggtgataaa ttcttatcag tggtttcag 360
 cataaggttt agcatgatga acttattctg agccatttct tgtatttctt cattttgggc 420
 aaatactttc tttagtgtt gagagtattg acaatcctcc ag 462

<210> 273
 <211> 282
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(282)
 <223> n = A,T,C or G

<400> 273
 ctgatcaaag catgggatat ttaatatagn ttatacataa tattttttaca tagaaaactt 60
 tacatnncat ttcattattat ataattctgc ttattctttc aaaaatttat acatccattg 120
 ggcaaggaat ggttttcatt aaattaccaa tattaatatgc acttaatcat tgggtatagg 180
 ttaaaccaaa gtaactatta actaactttt aggcatttta aggaggtaaa acatacattt 240
 tacacataag tatttgatgc aaatatgcag ataaaatttt tt 282

<210> 274
 <211> 125
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(125)
 <223> n = A,T,C or G

<400> 274
 cagccctaga cctcaactac ctaaccaacn ttntctaaaa taaaatcccc actatgcaca 60
 ttnaatcnct ccaacatact cggattctac cctagcatca cacaccgcac aatccccctat 120
 ctagg 125

<210> 275
 <211> 528
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(528)
 <223> n = A,T,C or G

<400> 275
 aaagctgtgg aaaagcttta ttatagattt ttntacagaa ttaaaaaagt tcaaacaata 60
 ataagccngg aaccacaaat aattaaaagg aaacacagca atcccataaa caagcattct 120
 ggcatctggt agaaattttc cctcaaatta tgaaatgtag ctctccatgc tttccaatga 180
 ttgttataat acccacaat atctgtgatt tcagtggaa actttaacaa agtttttctt 240
 ttttaaggcat gatctgatt ctttttttct tcaatatctc agtcatttca ggaactacct 300
 taaataaatc tgcaactatt ccataatctg ccacttggaa aattggagct tctgggtcct 360
 tattaattgc cacaattgtc ttgctgtcct tcacccagc taaatgttgg atgggtccag 420
 atattccaac agcaatataa agttctggtg ctactatttt tcccgctctgn ccaacttgca 480
 tgtcattggg aacaaagcca gcacacag cagcacggga agcaccaa 528

<210> 276
 <211> 420
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(420)
 <223> n = A,T,C or G

<400> 276
 aaatgtcttg tttcccagat ttcaggaaan tttttttctt ttaagctatc cacagcttac 60
 agaaacctga taaaatatac ttttgtgaac aaaaattgag acattttacat tttctcccta 120
 tgtggctgct ccagacttgg gaaactattc atgaatattt atattgtatg gtaatatagt 180
 tattgcacaa gttcaataaa aatctgctct ttgtatgaca gaatacattt gaaaacattg 240
 gttatattac caagactttg actagaatgt cgtatttgag gatataaacc cataggtaat 300
 aaaccacag gtactacaaa caaagtctga agtcagcctt ggtttggtt cctagtgtca 360
 attaaacttc taaaagttaa atctgagatt ccttataaaa acttccagca aagcaacttt 420

<210> 277
 <211> 668
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(668)
 <223> n = A,T,C or G

<400> 277
 ccaggggtggc tctgatatag cagccctggg ntatttttca tatttcagga agactggcag 60
 atngcaccag accctgaatt cttctagctc ctccaatccc attttatccc atggaaccac 120
 taaaaacaag gtctgctctg ctctgaagc cctatatgct ggagatggac aactcaatga 180
 aaattttaag ggaaaaccct caggcctgag gtgtgtgcc ctcagagact tcacctaact 240
 agagacaggc aaactgcaaa ccatgggtgag aaattgacga cttcacacta tggacagctt 300
 ttcccaagat gtcaaaaaca gactcctcat catgataagg ctcttacccc cttttaattt 360
 gtccttgctt atgcctgcct ctctgcttg gcaggatgat gctgtcatta gtatttcaca 420
 agaagtagct tcagagggta acttaacaga gtatcagatc tatcttgta atcccaacgt 480
 ttacataaa ataagagatc ctttagtgca cccagtgact gacattagca gcattcttaa 540
 cacagccgtg tgttcaaagt tacagnggtc cttttcagag ttggacttct agactcacct 600
 gttctcactc cctgttttaa ttcaaccagg ccatgcaatg ccaaataata gaaattgctc 660
 cctaccag 668

<210> 278
 <211> 202
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(202)
 <223> n = A,T,C or G

<400> 278
 aaattgggtat cgacgggaac caggggaagn tntaaactc ctaatctatt ctggatccaa 60
 ttngcnaagt ggggtcccat caagggtcag tggcagtgga tctgggacag atttcactct 120
 cacgatcagc agtctgcaac ccgaagattt tgcaacttac tactgtcaac agagttaacat 180
 gtcccggtac acttttggac cc 202

<210> 279
 <211> 694
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(694)
 <223> n = A,T,C or G

<400> 279
 ctgtacttgg acaaaataag ttaattctat ttggttgctc attaaagttt tatgtggcta 60
 tgnacccact ggagctaaaa attggctttt aactgtttcc aaatcagaac tagcagagga 120
 gagaagtaaa taaagccaat ggactccct tcagaggctc aaaatggtta gattttgatg 180

cagatttaac	cttagcgagt	ttcagtcagt	ccatttagat	gatcctgtag	gttcatacaa	240
atacactgaa	ccgttggttt	aactttctct	ccttcctcaa	agtttatgat	aaagagactc	300
atccctgtat	tgaggagtac	tgacataagt	tcagatctgc	tcagagtggc	tggttaaggaa	360
cacttaaggt	cagtcagaaa	ataatcaaac	agactttctca	tgtaagcacc	gtgactcaca	420
actaagacac	tggtctgctaa	tcctggaata	ccgctgtctg	aattaacttt	agagctgtga	480
ttttttccta	aaggaaatat	ctctgccaaa	gaagttttcca	gacagntgct	tggtgagatcc	540
ttggggaaaa	ctggtctttt	tgatccggtt	ctttcangan	taggtngaca	aaagaaatnc	600
aaaaaagnct	atcccacgcn	ttnttcacct	gggccccagcg	gnnctcctcc	nggggggggn	660
aaacacangg	gactcttccc	ngggctngct	tnng			694

<210> 280

<211> 441

<212> DNA

<213> Homo sapien

<400> 280

aaaaaacttc	catgcaactt	ctggtttatt	gtttggcaac	tccacatgat	aaaaaaataa	60
aaacagccca	accgagtttc	ggaattaagt	actcttctag	taagtgattc	aaacttgtaa	120
tatttgccac	aggactgact	tattttattt	ctagctagaa	gctcttaagt	tcacttgttt	180
atcagggcat	atacagaagg	gtttgttaaa	actcgatgtt	aactttacaa	ctttctgacc	240
tggtgcatga	attctcaagt	actgtatttc	actgtgttgg	tgtgtctgat	ggaaatttcg	300
aggtggtccc	acaaaaatat	tttatgtagt	gtgccttcaa	agagaacat	ttatttctct	360
tcacttatcg	tcccacaaag	tcacatttgg	tggtggtcag	ccaagtcgca	tctggtctag	420
ttttactctt	gtcccatttt	t				441

<210> 281

<211> 398

<212> DNA

<213> Homo sapien

<400> 281

aaatttgta	ggtctgaaga	atctaaaact	gttaatttaa	cccttaactt	gtgcctagaa	60
actacagcac	atataaaaata	tgtaaacacc	agcctgttgc	tgtacttttc	tgcttatttt	120
acagcctcaa	atattttctca	ttatcttgct	acttagttct	tcattgtttct	ccttctgact	180
tttaataatg	gtaataggaa	aacaaaaccc	aaagcttttc	agaacttcag	tgtgaggttt	240
cctattttga	caagttaact	tgtaaatat	caggttttac	gatgtataat	ttacctaata	300
gaccaaacta	actcatggag	atattttgaa	ctattattta	ggtacaaaact	ttataaagaa	360
tgtagtatg	tcataaaaata	taacattaca	gcttattt			398

<210> 282

<211> 226

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(226)

<223> n = A,T,C or G

<400> 282

aaaacaatat	tctctttttg	aaaatagtat	naacaggcca	tgcatataat	gtacagtgtg	60
ttacnccaat	atgtaaagat	tcttcaaggt	aacaagggtt	tggtttttga	aataaacatc	120
tggtatcttat	agaccgttca	tacaatggtt	ttagcaagtt	catagtaaga	caaacaagtc	180
ctatcttttt	ttttggctgg	ggtgggggag	cccaggccga	ggctgg		226

<210> 283
<211> 358
<212> DNA
<213> Homo sapien

<400> 283
aaacaaaaat actcaagatc atttatatatt ttttggagag aaaactgtcc taatttagaa 60
tttccctcaa atctgagggg cttttaagaa atgctaacag atttttctgg aggaaattta 120
gacaaaacaa tgtcatttag tagaatattt cagtatttaa gtggaatttc agtatactgt 180
actatccttt ataagtcatt aaaataatgt ttcacaaat ggtaaatagg accactgggt 240
tcttagagaa atgttttttag gcttaattca ttcaattgtc aagtacactt agtcttaata 300
cactcaggtt tgaacagatt attctgaata ttaaaattta atccattctt aatattttt 358

<210> 284
<211> 288
<212> DNA
<213> Homo sapien

<400> 284
aaaacttttg ttaagaaaaa ctgccagttt gtgctttrga aatgtctgtt ttgacatcat 60
agtctagtaa aattttgaca gtgcatatgt actgttacta aaagctttat atgaaattat 120
taatgtgaag tttttcattt ataattcaag gaaggatttc ctgaaaacat ttcaagggat 180
ttatgtctac atattttgtgt gtgtgtgtgt gtatatatat gtaatatgca tacacagatg 240
catatgtgta tatataatga aatttatgtt gctgggtattt tgcattttt 288

<210> 285
<211> 629
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(629)
<223> n = A,T,C or G

<400> 285
cctaaaagca gccaccaatt aacaaagcgt ncanntcaa caccactac ctaaaaaatc 60
ccaaacatat aactgaactc ctacacacca attggaccaa tctatcacc tatanaagaa 120
ctaagttag tataagtaac atgaaaacat tctcctctgc ataagcctgc gtcagattaa 180
aacactgaac tgacaattaa cagcccaata tctacaatca accaacaagt cattattacc 240
ctcactgtca acccaacaca ggcargctca taaggaaagg ttaaaaaaag taaaaggaaac 300
tcggcaaadc ttaccccgcg tgtttaccaa aaacatcacc tctagcatca ccagtattag 360
aggcaccgcc tgcccagtgga cacatgttta acggccgcgg taccctaacc gtgcaaagggt 420
agcataatca cttgntcctt aattagggac ctgtatgaat ggcttcacga gggttcagct 480
gtctcttact ttttaaccagt gaaattgacc tgcccgtaga gaggcnggca tgacacagca 540
agacgagaag accctatgga gctttaattt attaatgcaa acagnaccta acaaacccca 600
caggtcctaa acttacccaa accctggca 629

<210> 286
<211> 485
<212> DNA
<213> Homo sapien

<400> 286
aaatgtactt gtcagctca actgcatttc agttgtatta tagtccagtt cttatcaaca 60

ttaaaaccta	tagcaatcat	ttcaaacta	ttctgcaaat	tgtataagaa	taaagttaga	120
attaacaatt	ttattttgta	caacagtggg	atcttctgtc	atggataatg	tgcttgagtc	180
cctataatct	atagacatgt	gatagcaaaa	gaaacaaaca	aaagccagga	aaacactcat	240
tttcgccttg	aatatgtaaa	tgggattaat	tttgtcctgt	gccttatgtg	gaaaggaact	300
tctttggttt	tccttttttg	ttctgggtga	agcatgtgca	ggagacatat	catccaaaca	360
taaaccatta	aaatgtttgt	ggtttgcttg	gctgtaattt	tcaaagtagt	taattgagga	420
caaagggtaa	tgcagaagtg	atagctttgg	tttgcctgag	cttggtttta	gtggccttga	480
tattt						485

<210> 287

<211> 340

<212> DNA

<213> Homo sapien

<400> 287

cctggagtcc	aataaccacc	ccctcatacc	acaccctgtg	catacaccag	ccaagccttt	60
cctgggtctg	gaaggggaaga	gaaaaaagac	gcagggccacc	tgggggttct	gcagtctttg	120
gtcagtcag	ccttctatct	tagctgcctt	tggcttcgcg	agtgtaaacc	ttgcctgccc	180
ggaggcagga	ggcccagctg	gacctccgag	ggccatgagc	aggcagcagc	catcttgccc	240
tcaagcttgc	ctttcccttg	agtccctctc	tcccctcggc	tctagccaga	ggtgtagcct	300
gcagatctag	gaagagaaga	gctggggagg	aggatgaagg			340

<210> 288

<211> 290

<212> DNA

<213> Homo sapien

<400> 288

aaacagtctc	tcctcgggtg	tctccttgct	aaactgttca	tcccagtttc	ctctgaaata	60
gacagcattc	accagaacca	gccttgtaaa	tggatccact	gagcccggag	agagcaactc	120
cgcaatttta	ccttctgtct	tttcagctac	ccaggtgttt	atgtgttttc	tggacttctc	180
tacggcgctg	ataaagtcaa	gctcctccat	ctctgcttgg	tagaattttt	ggcaggaatc	240
tctaaaagat	gagaggaaat	cacaagactt	ttccccaag	agcctgttgg		290

<210> 289

<211> 404

<212> DNA

<213> Homo sapien

<400> 289

ccaccacgc	ttaggttccc	atcacactga	tgactccggg	tttggcgagc	acaggagcgc	60
aaaccttttc	acattctttc	tgtgatccaa	atttgttttc	gtttccacca	caacctccat	120
accagaatct	tgcacagctt	ttggtgtttg	gatcatagta	ccattttaat	atgaaatccc	180
tgcaagttcc	ttcgtctttc	ggcaacttgc	atatactgt	ttcagtgaga	gccaatggtt	240
ctgtgctcac	cattagattg	atggttgaac	tagaagctga	ccttgctggc	tgtggaggtg	300
ggggctgaga	tttctttgta	ctgaaacttc	cgtggtaggt	ggctctgacc	tgagacctca	360
ggtagcagac	cacagccaca	tggtatgtct	gcccagcgag	cagg		404

<210> 290

<211> 384

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (384)

<223> n = A,T,C or G

<400> 290

ccaggcgctc	cttgtcggca	tcagggaggg	tggccttgaa	ctgctcatgg	gctgtgggtca	60
gtccctggat	ctcctcaatg	gtgtgcacaa	tgaaggtgtc	ctgcaggtcc	tccatggccc	120
cctccatcca	gttggtgaag	gggtgcagccc	gcttggcata	ctccaagtac	agctgggtcaa	180
tggctccag	cagtttctcg	gtccgctcca	gagcttcctt	tcgcttctga	gttagggccc	240
ccagattgtc	ccactgggtca	cagatctttt	ggcaacgggc	gttgacactg	ggtgagtcac	300
aatantccag	ctcattgagc	tctgtgcga	tggcggcaat	ctgctccaca	cggctctggt	360
gggcagccag	gccactctcg	aagg				384

<210> 291

<211> 278

<212> DNA

<213> Homo sapien

<400> 291

aaagttttatt	tttactatct	ctttatcact	ttattgtatc	atcaccattg	gtttcataat	60
gtaaatacta	tatgttgaac	aaattaaatg	tcaaaatctt	ttattaccat	agtccatggt	120
aatagtgggg	ctttcaggtg	tttagagatt	ttttttgttg	ttgttaacat	tcattgcaaa	180
agtactagat	ggtgtataac	tctagagttg	aattttaagg	gattccctaa	tatgtatact	240
atctttttat	ctgaagtaat	aaataaacaa	tgatcttg			278

<210> 292

<211> 177

<212> DNA

<213> Homo sapien

<400> 292

ccttggtccc	gtcattcttg	tccagtttga	taggttcagg	aaattcgttg	tacagctcca	60
cctccgtttc	ctgcttaagt	gcattccgtg	caatcgtctg	gaacgcctgc	tccacgttga	120
tggcctcctt	ggcactggtc	tcaaagtagg	gaatgttggt	tttgctgtag	caccagg	177

<210> 293

<211> 403

<212> DNA

<213> Homo sapien

<400> 293

aaaaagaagg	acttaggggtg	tcgttttcac	atatgacaat	gttgcattha	tgatgcagtt	60
tcaagtacca	aaacgttgaa	ttgatgatgc	agttttcata	tatcgagatg	ttcgctcgtg	120
cagtactggt	ggttaaatga	caatttatgt	ggattttgca	tgtaatacac	agtgagacac	180
agtaatttta	tctaaattac	agtgcagttt	agttaatcta	ttaataactga	ctcagtgtct	240
gccttttaaa	ataaatgata	tggtgaaaac	ttaaggaagc	aaatgctaca	tatatgcaat	300
ataaaatagt	aatgtgatgc	tgatgctggt	aaccaaaggg	cagaataaat	aagcaaaatg	360
ccaaaagggg	tcttaattga	aatgaaaatt	taattttggt	ttt		403

<210> 294

<211> 305

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(305)

<223> n = A,T,C or G

<400> 294

aaagcaatct	ggcatggtgt	cctgtagtga	agcagaggat	cataacataa	gtaaactctc	60
tatgggtgga	agttggagag	aaggacattt	tggttttgta	catgaaaaga	ctctccagat	120
agaaacagat	tctgcccata	agtgaaataa	aatgctttgt	gggggtaatg	agtgacttat	180
agtattcagg	cagatgttac	ataactgcta	attaagtttc	cctggattga	ntttanncaa	240
anaattgaaa	gtngattttg	gtcangtgtc	agnaaactac	tgccataaaa	cccatatcnt	300
accca						305

<210> 295

<211> 397

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(397)

<223> n = A,T,C or G

<400> 295

cctatctggt	tggtcttttt	gaagacacca	acctgtgtgc	tatccatgcc	aaacgtgtaa	60
caattatgcc	aaaagacatc	cagctagcac	gcgcatacg	tggagaacgt	gcttaagaat	120
ccactatgat	gggaaacatt	tcattcccaa	aaaaaaaaaa	aaaaaaaaat	ttctcttctt	180
cctgttattg	gtagttctga	acgttagata	ttttttttcc	atgggggtcaa	aaggtaccta	240
agtatatgat	tgccgagtgg	aaaaataggg	gacagaaatc	aggtattggc	agttttttcca	300
tttncatttg	tggtngaaatt	tttaataata	atgcggagac	gtaaagcatt	aatgcnagtt	360
aaaatgtttc	agtgaacaag	tttcagcggt	tcaactt			397

<210> 296

<211> 447

<212> DNA

<213> Homo sapien

<400> 296

ccatcctcga	tgttgaagtt	gtcgtggggc	ccgaagacgt	tggtggggat	gacagcgggtg	60
aaggtgcagc	cgtactgctg	gaagtaggcc	ctgttctgca	cgtcgatcat	cctcttggca	120
tacgagtacc	caaaattgct	gttgtgggga	ggcccattgt	ggatcatggt	ctcatctatc	180
gggtaggctg	tcttgtcagg	gaagatacag	gtggacaggc	aggacaccac	cttgcgggcg	240
cccacctcga	aggccgagtg	caggacgttg	tcgttcatgt	gcacgttttt	cctccagaag	300
tccaaattgt	atttgatatt	ccggaacagg	ccccccacca	ttgcagcaag	atggatgacg	360
tgtgtgagtt	ggaccttctc	aaacagggcg	cggttctgtg	ctgtatccgt	gagatcggcg	420
tcttttagagg	agacaaacac	ccagttcc				447

<210> 297

<211> 681

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(681)

<223> n = A,T,C or G

<400> 297

aaataacagc	atgtaaaata	ttaaaatata	agctttcaaa	aataaatata	taaataagta	60
gaacctctgt	aagaaatagt	caaacacatt	aagtcctttc	cagctgtccc	tagaaagctg	120
ctgttctctt	tttcattttc	agctctggta	agggcagggg	ccacctgca	ggaagtgtca	180
atgatacgt	gataagcttc	ttacttctct	cctgtcagtt	ggtgctcccc	ctgtgatgag	240
aaaagggtta	ctgttgcaag	tgctaaggaa	ggctgctctt	ctgtcactct	gaagttgctt	300
ggagggatgt	ccccatgcag	actctctccc	agccctccac	tcagggaagg	tctgtctgta	360
cccactgcct	tctatagcag	aaaacttgca	ctcctgaatg	cttttttttt	ttttcaagaa	420
agaagnggct	gnngactcaa	ctagattctt	ggtttgaaaa	agccaaaaca	tattggtcac	480
tgattgtcac	attgggttag	aaatgtccat	tcatgatctc	ccttaagctg	cacacaacct	540
tatgaaataa	ctaccattat	ctaccctatt	ttgctaaagc	tcaaagagat	taaataatgt	600
tgacagggat	cttagccttg	aactcactga	aggngttact	gcaaagttct	gctcttcacc	660
aagaaggntt	acaggccaaa	g				681

<210> 298

<211> 353

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (353)

<223> n = A,T,C or G

<400> 296

cctggcctta	gaccagacat	ttgaagaagg	ctccaggcag	ggaaaggaaa	ggagaggcca	60
gctccacnct	gnccctcccc	tgccccacg	tctccagcaa	cacaaggcgg	ccagtggacc	120
gtgaaccatt	tatttccaaa	ctataaagaa	acctgctctc	tgagaaaana	cactgcccag	180
gnatgaagc	tccagccctt	ggaggtccaa	aacctcagtc	aaactcagtc	ccttttagaaa	240
gctgctgtgc	cttggaatg	annntcggnt	gtcanagcct	gggaagtgg	gggaagaacc	300
agccactcc	cctctcctgc	tgcgattcca	gcgcncgttg	ggnccagatc	tgg	353

<210> 299

<211> 560

<212> DNA

<213> Homo sapien

<400> 299

aaagttcaag	gactaacctt	atttatttgg	gaaaggggag	gaggaaggaa	atgatatggt	60
accagacac	tgggctaggc	tgcaacttta	tctcatttaa	tactcccagc	tgtcatgtga	120
gaaagaaagc	aggctaggca	tgtgaaatca	ctttcatgga	ttattaatgg	atttaagagg	180
gcatcaatca	gctcaactca	agatttcata	atcattttta	gtatttagat	tgtgcctcaa	240
agttgtagta	cctcacata	cctccactgg	tttctgttg	taaaaacctt	cagtgaattt	300
gaccattgtg	ctcttggtct	ttgggctgga	gtaccgtggt	gagggagtaa	acactagaag	360
tctttagtac	aaaactgctc	tagggacacc	tggtgattcc	tacacaagtg	atgtttatat	420
ttctcataaa	gagtcttccc	tatcccaagg	tcttcatgat	gccagtagcc	atatatgata	480
aattatgttc	agtgataact	tagttatcag	aaatcagctc	agtggctctc	cccgccatga	540
ttcacatttg	atgagttttt					560

<210> 300

<211> 165

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(165)

<223> n = A,T,C or G

<400> 300

aaaaactaca taggggtgtg tgtgtgtgtg tatgtttatt ttatacacac atatttgtat	60
attctaatat attactaagg caattttaat gaattacat gtatataaaa aaatatctgn	120
cacttggcac acaggtttgt atgtatgtg atatatatat gtatg	165

<210> 301

<211> 438

<212> DNA

<213> Homo sapien

<400> 301

aaaatatatg tatttaaaaa caaaaagcaa cagtaatcta tgtgtttctg taacaaattg	60
ggatctgtct tggcattaaa ccacatcatg gaccaaatgt gccatactaa tgatgagcat	120
ttagcacaat ttgagactga aatttagtac actatgttct aggtcagttc aacagtttgc	180
ctgctgtatt tatagtaacc attttccttt ggactgttca agcaaaaaag gtaactaact	240
gcttcattct cttttgcgct tatttggaat ttttagttat agtgtttaac tggcatggat	300
taatagagtt ggagttttat ttttaagaaa aattcacaag ctaacttcca ctaatccatt	360
atcctttatt ttattgaaat gtataattaa cttaactgaa gaaaaggttc ttcttgggag	420
tatgttgtca taacattt	438

<210> 302

<211> 172

<212> DNA

<213> Homo sapien

<400> 302

ccaaaacagg agtcttgggt gatatcatca tgagaccag ctgtgctcct ggatggtttt	60
accacaagtc caattgctat ggttacttca ggaagctgag gaactggtct gatgccgagc	120
tcgagtgtca gtcttacgga aacggagccc acctggcacc tatcctgagt tt	172

<210> 303

<211> 552

<212> DNA

<213> Homo sapien

<400> 303

ccagcctggt gcaggctgct tcgtagcggg cgtcggctgc ggacttcct tcccgggtct	60
ggatcttttc atcctaccag atgagaaagg gaatgagtga atggagtgc cccgcaccct	120
gtcactttcc tgagacatga ctgccaggaa gaagagctgc tctggtctcc atcagggctg	180
gcaggacaaa ctgaccagtg agtcagtagg cagagttcac actgaaaaag ggcacaaggg	240
ctgtcccaca atgggaggaa atggggtctc agaacttcta cttctctgaa aactaagaca	300
caattgggac aaccaccacc cccgtgtgag atttctcacc tcgagacagg acaagatgaa	360
gttcacggct tcttctgggg taaagacctt gaagagccca tcacaggcca acaaaatgaa	420
cctacaacac caggagagaa tataaacggg ttttaggcc aacaaaaaaa taataataa	480
aaaaagggcc tggagatgga gataaaataa atatttgtcc aactattcaa aggctaagg	540
ttttttttct tt	552

<210> 304

<211> 601

<212> DNA

<213> Homo sapien

<400> 304

cctttgattc	ttggtagtag	attgcatgta	aaatgtttat	agaagctac	ttttccttca	60
tgggaagaaa	ttcccacatg	agattcataa	attcttagac	tccgtggctt	ctttgggtccg	120
gaatgcttaa	actcatatga	gtgttctgga	tcccagtgta	tccaatcata	attcacatta	180
tcaccttcac	gaaccacata	ctttgcccac	ggtgaaatac	gatacaagat	ctctccgctt	240
ttactagtaa	taactacctt	taatttggat	ccatgaggca	cgagtacaga	tttattctgc	300
tttgggtgga	tatacagctc	ccattttcca	taatccagtt	ttttgtatgg	gtacgaaaat	360
ggattccaac	cattaaaatc	tccagtaaga	aaaactcctt	ctgctcccgg	ggcccattct	420
ttgcagtata	aaccaccatc	agcacatctg	tggacgccaa	atgattcata	gcctctggaa	480
aacttatcaa	taccaccttc	attttctcca	atgttcttca	aaatttggct	aaactgctta	540
tacctgcgct	ggaagtccac	ggcgtagggc	ttcaagtacc	ggtcgatctc	caggagtctg	600
g						601

<210> 305

<211> 401

<212> DNA

<213> Homo sapien

<400> 305

aaataacagc	atgtaaaata	ttaaaataca	agctttcaaa	aataaataca	taaataagta	60
gaaccctcgt	aagaaatagt	caaacacatt	aagtcctttc	cagctgtccc	tagaaagctg	120
ctgttctctt	tttcattttc	agctctggta	agggcagggg	ccaccctgca	ggaagtgtca	180
atgatacgct	gataagcttc	ttacttctct	cctgtcagtt	gggtgtcccc	ctgtgatgag	240
aaaagggtta	ctgttgcagg	tgctaaggaa	ggctgtctct	ctgtcactct	gaagttgctt	300
ggagggatgt	ccccatgcag	actctctccc	agcctccac	tcagggaagg	tctgtctgta	360
cccactgcct	tctatagcag	aaaacttgca	ctcctgaatg	c		401

<210> 306

<211> 313

<212> DNA

<213> Homo sapien

<400> 306

aaactgacta	tggattcctt	gaaggtctgg	cagttgttga	tgatggcgat	catgtactga	60
acgtagcagt	gagggtgctg	ccgattcctc	aggtgctctt	ctttatacag	ctgcgcttca	120
tctttatata	tgaggacaga	caggcttcgg	tcagacagca	ctaagggcaa	catggagctg	180
tttcaaatgc	cacgctgacg	tcacgcctgg	cctgaaattt	cacatcacta	acatctgacc	240
ggatgagcct	ctaaaaataa	aacaatcttt	agacgatcca	gactaatgga	aggacagaga	300
ggttgattac	ttt					313

<210> 307

<211> 366

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(366)

<223> n = A,T,C or G

<400> 307

aaagatgctg	ntaatgaaca	ttacggacaa	ttcatgggtg	ggctagtgtg	taacacttca	60
gctgattttt	cttatgagat	ggaaaaaaaa	aatcagccaa	gtaagggcac	atcttcactt	120
catttataag	tcagcatcca	aggtaaaaaga	attctctgtt	ggacttgaca	tcactcccat	180


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cctctgatac tcgcctactc tcttctcaaa gaagttagnt ctttccttcc antgaaatat 240
tctcataaaa gtcaaatggg ttctctactc tgaaaacctt gctaaaaccc aattccagca 300
taagtttgtc tgncaaaaac ncaatgnatt gcttcattaa antgcaattc atcccaatga 360
gcttcc 366

```

<210> 308

<211> 534

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(534)

<223> n = A,T,C or G

<400> 308

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ccagctatca gctgatcgtc ttctgtctgg acgctcgctc tgcttctgac atcaaaatct 60
tctgtctcaa agtcagagtc atccaactcc tcaggggtcc ttatcatcag cactgctttc 120
ctgatgtccc ggatgccatc atataccagg cggaagcat cgataaactc attctcatcc 180
atgggctggg cagggctccga gctgagggct tccacggctg cttctacttg ctcagtaaaa 240
cgtggcatga ctgtgttga gagcagctta gtggcttcca gaaccttctc tgtgtagact 300
cctggctcat agtcgtccat ctctgagggt actacgtgaa tgacccgggc tgcccgccct 360
cgaattgcac cagctgtgcg gccaggccat ccacatcctt ctcttgaga gcaatgacac 420
atttggtcac atcttccaaa atgtgattct ctgagacagc caagaagtca tcaatggaag 480
taatgncatc gacagcatct gtgagaacac cgacttgttt ttccattgnt cttt 534

```

<210> 309

<211> 164

<212> DNA

<213> Homo sapien

<400> 309

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catactcctt acactattcc tcatcaccca actaaaaata ttaaacacaa actaccacct 60
acctccctca ccaaagccca taaaaataaa aaattataac aaaccctgag aaccaaaatg 120
aacgaaaatc tgttcgcttc attcattgcc ccacaaatcc tagg 164

```

<210> 310

<211> 131

<212> DNA

<213> Homo sapien

<400> 310

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aaaaatcatt tatctttcgg tgcttcaaca tgatgccaaa caaaaatcta ctgaataaaa 60
atagcaagga agggaatcaa acatttataa gatataatta ttatttttct gaccaaagtg 120
caatgatttt t 131

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<210> 311

<211> 626

<212> DNA

<213> Homo sapien

<400> 311

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cctatgtgcg ccagtttcag gtcacgaca accagaacct cctcttcgag ctctcctaca 60
agctggaggc aaacagtcag tgagagtga ggctccagtc agaccgcca gatccttggg 120
cacctggcac tcaagcatt tgcacgatgt ctcaaccaac atctgacatc tttcccgctg 180

```

agcaacttcc	tgctccacgg	gaaagaggtc	gatggattta	cccctggacc	cataagtctg	240
ttcatcctgc	tgaagtcccc	tccccattgc	tccttcaagc	caaaactaca	ctttgctggg	300
tcctgtcccc	tctgagaaag	gggatataga	gctccttcc	ctatgtcctc	ccatcgagat	360
ctgttctggg	gatggagctt	ccaacttcc	cttgacagc	gaaagaatgc	tgctcaccct	420
tctgtcttgc	agagtgggat	tgtgggaggg	attggcagcc	ttcttctcca	ccacctgtcc	480
agcttctctc	tggtcagggc	tgggaccccc	aggaatatta	tggtgcccgtg	tgtgtgtgtg	540
tgtgtgtgtg	tcttctttta	gggagcagga	gtgcacatcg	taattgaggg	tagatgttgt	600
gtgtgctggg	gaggggtcct	tctgtt				626

<210> 312

<211> 616

<212> DNA

<213> Homo sapien

<400> 312

aaaccaaaga	aattaagaaa	aaagacttca	ttgcttgaat	gacgcgaaca	gctgtctgag	60
tcacctagac	tttaacacca	cctggggccc	tgggaatgac	gctgacgaga	gatctgcaca	120
tagtaggcgt	gggctccaaa	tgtgtctcatc	agctgacttc	acatcctcac	aagtcagcct	180
cagatatgac	ccaagggata	cgtaccatct	cttcttgaaa	cagcgtgtca	aattatatat	240
atgtatgcaa	aaaagagtaa	tgtactaagc	aaaccaagtt	tcgtcttttt	cttctgaatc	300
tggttttaat	gtgacctgtc	atccccatct	ttcgaattta	tgagctccat	cttctctaga	360
ctgttaactt	cttgaggaaa	acatgctatt	ttaccacctt	tcactgctga	atccctagcc	420
cttaagcaca	gtctctggca	cagaataaat	acgaaatgaa	tgagtgaatg	aatggatgga	480
tgggtgaaga	gaaaaggcaa	tgcacaagat	ttaccatca	aaatccacca	atggctccta	540
aaaatgggtt	tgtcagtaga	gatgtgaat	atattcatat	aatacattta	tttcaatact	600
attaagaatt	ctagtg					616

<210> 313

<211> 553

<212> DNA

<213> Homo sapien

<400> 313

aaaaaatggc	agcattgtac	ttgaatcaga	aagcttactg	ggatttcctc	atcgaaagta	60
gagattgcag	ctaactcctag	taccttttgt	tagtaattac	ttaaggcaca	gtgcaaagtt	120
gaaggactgt	tttggtacaa	actcaagcca	gctacatgta	tgcttgccct	ggtatccttg	180
ctagagcaca	tgcgggtata	ataccgtatt	atacacaaca	aggccaccct	gttgtatctg	240
tgttacaatt	aaacatcagt	cccagaaagt	gaaccctagt	catttattat	agggtgccac	300
ctctgacttg	gaacaaaatg	ccactccatt	catgttcatt	tttgtcctgg	agaggattta	360
tttcctaaaa	gattctgaaa	gccaacaaat	caatgtagtt	cttcataagag	aacttaagag	420
taaggctcaa	aatggcctca	aaatgggctt	cttggatgac	ttccaacagt	gactggcctt	480
ctcaacactg	cagatgtctg	agcactacca	taacctaacg	aagtgaggaa	ggaggaggca	540
aattgggtatt	ttt					553

<210> 314

<211> 330

<212> DNA

<213> Homo sapien

<400> 314

ccagcgactc	cagcgggtggc	agcaggcagt	gcacgtactc	tgggcctccc	accagggtag	60
tgaaggttcc	cagctgttct	gccagggcca	ggaggacctc	atcttcatca	tagatgggat	120
ctgtaaggaa	aggcagaagc	tcacttcggg	tcctttcaac	cccaagggcc	aaggcgatgg	180
tggacagctt	cttgatgctg	ttgaggcgaa	gctgaacgtc	ctcattgcgg	agttcgtcta	240
tgagcaccgc	gatggggtae	agcgagtcgt	cgccgtcggc	cgccgccatc	ttggctccgt	300

ccctttcctg tcagactgcg gccagcgctg

330

<210> 315

<211> 380

<212> DNA

<213> Homo sapien

<400> 315

aaaaatgaca ttgcgttttag cttattgtaa gaggttgaac ttttgatatt tgtaactatc	60
tttaagccct tcagtttata attcatataa aatgcctttt gtatttataa taatcctatt	120
ttaatcagtg catgaaattt gcttttttaa agttcatttg aatgattatt ccttccctct	180
aaagaaatga ttttggtaat gttgagaggt accttaccac aaatcctaac tgtaagtgtg	240
ttcatgggta ttttcaaaag aattatgact cttcccaaaa agaatcctaa aaaacttgta	300
ataaacctat aaagctgatt tgcataatga caaaattttg aatagcaaat ataggcaact	360
catatatgta tataattttt	380

<210> 316

<211> 222

<212> DNA

<213> Homo sapien

<400> 316

aaactacaga gggttttcca gctattattt ccttttagttt ctaaaagtaa cgacttatat	60
taatgtttta taaaagatag tgatgaaaaa aaggtaatgc tgaaataaag gcgcttttag	120
aaatatttaa ggacaacata aggtattaat attggaaaaa aactgtacat attttcaagc	180
acaacactga aatattgcag cagtgtttta ctgaattggt tt	222

<210> 317

<211> 490

<212> DNA

<213> Homo sapien

<400> 317

ccttgaatga gcgtggagag cgattaggcc gagcagagga gaagacagaa gacctgaaga	60
acagcgccca gcagtttgca gaaactgcgc acaagcttgc catgaagcac aaatgttgag	120
aaactgccta tcttgggtgac tcttcttaag agaaactgaa gagtttggtc agcagttttt	180
acaagaattc gggacctccg cttgcttctt tttttccaat atttggacac tttagagtgt	240
ttttgtttt tcttttcaga tgtaaatgtg aaagaaaggg tgttgcattt ttacatttcc	300
ctaatagatc tgctaataaa tgctacaata gcacgcgctt cattttgggt ttttgcctcc	360
tcccactgtg tgtatgtgtg tatatgtatg ttttgaatat gttttcttta ttaaaaaata	420
ttttttgtag tttgaatatg aaatttggac caaatgataa actgcgctga gtctaaactg	480
gcaacatgta	490

<210> 318

<211> 340

<212> DNA

<213> Homo sapien

<400> 318

cctggagtcc aataaccacc cctcatacc acaccctgtg catacaccag ccaagccttt	60
cctggtctgg gaagggaaga gaaaaaagac gcaggccacc tgggggttct gcagtctttg	120
gtcagtcacg ctttctatct tagctgcctt tggtctccgc agtgtaaac ttgcctgccc	180
ggaggcagga ggcccagctg gacctccgag ggccatgagc aggcagcagc catcttggcc	240
tcaagcttgc ctttcccttg agtccctctc tcccctcggc tctagccaga ggtgtagcct	300
gcagatctag gaagagaaga gctggggagg aggatgaagg	340

<210> 319
 <211> 373
 <212> DNA
 <213> Homo sapien

<400> 319
 aaagatgctg ttaatgaaca ttacggacaa ttcattggtg ggctagtgtg taacacttca 60
 gctgattttt cttatgagat ggaaaaaaaa atcagccaag taaggggcaca tcttcagttc 120
 atttagaagt cagcatccaa ggtaaaagaa ttctctgttg gacttgacat cactcccatc 180
 ctctgatact cgcctactct ctctctcaag aagttagtct ttccttccag tgaaatatcc 240
 tccataaagt caaatgggtt ctctactctg aaaaccttgc taaaaccag ttccagcata 300
 agtctgtctg ccacaaactc aatgtattgc ttcattagag tgcaattcat gccaatgagc 360
 ttcacaggca agg 373

<210> 320
 <211> 509
 <212> DNA
 <213> Homo sapien

<400> 320
 aaaaacaaaa ttaatttttc atttcaatta agaccccttt tggcattttg cttacttatt 60
 ctgccctttg gttaacagca tcagcatcac attactattt tatattgcat atatgtagca 120
 tttgcttctt taagttttca acatatcatt tatattttaa ggcagacact gagtcagtat 180
 taatagatta actaaactgc actgtaattt agataaaaatt actgtgtctc actgtgtatt 240
 acatgcaaaa tccacataaa ttgtcattta accaacagta ctgcacgagc gaacatctcg 300
 atatatgaaa actgcatcat caattcaacg ttttgggtact tgaaactgca tcataaatgc 360
 aacattgtca tatgtgaaaa cgacacccta agtcttcttt tttaaaaatg acattgcgtt 420
 tagcttattg taagagggtg aacttttcta ttttctaact atctttaagc tcttcagttt 480
 ataattcata taaaatgcct tttgtattt 509

<210> 321
 <211> 617
 <212> DNA
 <213> Homo sapien

<400> 321
 ccaaggcccc ttttgcagcc cacggctatg gtgccttctt gactctcagt atcctcgacc 60
 gatactacac accgactatc tcacgtgaga gggcagtgga actccttagg aaatgtctgg 120
 aggagctcca gaaacgcttc atcctgaatc tgccaacctt cagtgttcga atcattgaca 180
 aaaatggcat ccatgacctg gataacattt ccttccccaa acagggctcc taacatcatg 240
 tcttccctcc cacttgccag ggaacttttt tttgatgggc tcttttattt ttttctactc 300
 ttttcaggcg cactcttgat aaatggttaa ttcagaataa aggtgactat ggatataatt 360
 gagccctctg gtccaggtct cagtttacct aatattacct cagaaaggat atggagggaa 420
 gatgatcttt ttgccaggtc tgacttttct tctgtctccg ccttccatta acgctcagta 480
 ccttttagca gctgacggcc ccacgttcta ctccatgctt ggcttctctt ccaactagct 540
 ctttcatata ttttacttgc tagtatctcc attctctcta aagtagtggt tctttttgcc 600
 cttaaactta aattttt 617

<210> 322
 <211> 403
 <212> DNA
 <213> Homo sapien

<400> 322

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aaaaagaagg acttaggggtg tcgtttttcac atatgacaat gttgcattta tgatgcagtt      60
tcaagtacca aaacgttgaa ttgatgatgc agtttttcata tatcgagatg ttcgctcgtg      120
cagtactgtt ggttaaatga caatttatgt ggattttgca tgaatacac agtgagacac      180
agtaatttta tctaaattac agtgcagttt agttaatcta ttaatactga ctcaagtgtct      240
gccttttaaat ataaatgata tgttgaaaac ttaaggaagc aaatgctaca tatatgcaat      300
ataaaatagt aatgtgatgc tgatgctgtt aaccaaaggg cagaataaat aagcaaaatg      360
ccaaaagggg tcttaattga aatgaaaatt taattttgtt ttt                          403

```

<210> 323

<211> 298

<212> DNA

<213> Homo sapien

<400> 323

```

ccagaattag ggaatcagaa tcaaaccagt gtaaggcagt gctggctgcc attgcctggt      60
cacattgaaa ttgggtggctt cattctagat gtagcttggt cagatgtagc aggaaaatag      120
gaaaacctac catctcagtg agcaccagct gcctcccaaa ggagggggcag ccgtgcttat      180
atTTTTatgg ttacaatggc acaaaattat tatcaaccta actaaaacat tctttttctc      240
ttttttctcg aattatcatg gagttttcta attctctctt ttggaatgta gatttttt      298

```

<210> 324

<211> 78

<212> DNA

<213> Homo sapien

<400> 324

```

ccatgggaag gtttaccagt agaatccttg ctaggttgat gtggggccata cattccttta      60
ataaaccatt gtgtacat                                     78

```

<210> 325

<211> 174

<212> DNA

<213> Homo sapien

<400> 325

```

ccatcatggg caggaactcc gggaagtcaa tgggcccggt cccatctgca tccacctcat      60
tgatcataac ctgcagctct gcttcagtgg ggttctgtcc cagggatctc atcactgtcc      120
ccaactcctt ggtggtgata gtgccatctc catccttgtc aaagagggag aagg          174

```

<210> 326

<211> 679

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(679)

<223> n = A,T,C or G

<400> 326

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aaaactgaaa tacctcttaa aataatttga tccccagcgt ttgctctttt tgaagtaacc      60
aaattactct taaaaaggat ggntgccaaag atggaaagtc ttactgggtt ttcattgtaa      120
cctattcttt ggacataact atgaattttg tatacaatgc acttcatgaa aagttgtggc      180
tccccagat tgcccacaag tgtgatcttg aagtcctaaa catttgtcca tgtaagcttc      240
aaaacagcgt taactgagtt attcaagtag cagtacttaa agatacaatt cttgaagcag      300

```

```

tttcaatggt ttctgatcca aataatcagt ttctgaacat tactacttca cataatagag 360
tccatcttca gtttcttctc actttctctt tcccttttgg gtttcctttt tgtggcctga 420
ggccaccagt tctttgggta ctatcaagat acttccatca tgggtacact ggagagcata 480
gtggttggga ttgactggcc taccttggtc atctcttaat ctactaaaaa tatcatgata 540
aaggtcatgc agtttctggt tcattatggt aatagctttg gtacattgtg cttgctctct 600
cttaanagtt tccctctttg cttgcaagtt acatacatca tcttctaaat tcaaaattat 660
gtccattttg gcgtttacc 679

```

<210> 327

<211> 619

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(619)

<223> n = A,T,C or G

<400> 327

```

aaaataagtt actggtaaatt ggagttgcat tctatagtca cttataaat attaacaaaa 60
tatttataac tggaacctta atgaaatgta tcatcaaatc aggtaaaagc aacttgctcg 120
cagttaccaa agcctanata cgcgttagat gcgccttttc cggcctgtgc gtctgctctg 180
gttctcttca ggcagcaaag ctggggaagg aagctcaggc aggagcctcc ccgacgccac 240
aacggcacia gcagcagcta aagcaccgca ctttgcctta ctaacctttt acttaaatga 300
ggttttgcca aatccacatc tggaaccgcg tcacacccat ttgcaaggat gtttgttctt 360
tgatgaaact gcactctctac tgcacatgag ggctttcatt gtaggacaag aggagagttc 420
gtttattttt gtaactgttt tacatgttcc gattagttaa tcggtagctt atgtcatttg 480
ctatgcctgn agncttctaa tctctcttta ctaaaacatt acttcaaatt tgaattgacc 540
cttggttata atttatttag ccgggatttg tgtgtcattg tagagcaact ctaattcaag 600
aatagtgaca actttttaag 619

```

<210> 328

<211> 132

<212> DNA

<213> Homo sapien

<400> 328

```

aaatccaaat acaaaagcat agtctctgca agattttggt ctttgaattt cttgatattg 60
taattgatta ttgataactg tcatcatgaa attatctctc aataataaga taaataaact 120
agcatatgaa tc 132

```

<210> 329

<211> 854

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(854)

<223> n = A,T,C or G

<400> 329

```

ccttgaggta actattgcaa aatatacagt gtaagttcag tctgatggaa accccagatt 60
catcaaggat acaaatctac agtagcccaa tggcggtttc atagtgtata atttattatc 120
aataaaatta actccgttac aatcagcatt catttctctc aattaaaatt aagcataaac 180

```

cctaggtagt	aaccttctgc	acatatgtat	agctccgaat	ttcctcactg	ttcgtctggt	240
gcaaaaacaa	tattcaagct	tgtctgatta	tgcatatttt	ctttaatcat	atagattata	300
tatacaatag	acaagacagg	actatataga	taatggacag	acttaaatgc	ccgcattttt	360
aagggtggaga	aaatgatgaa	tctatgcac	cccgagaaca	cttaaaattt	ttttttattt	420
cactgggaaa	ttcttacagc	tactttacaa	tcataggtta	acagcctagt	tatacagaag	480
acatatcca	ctacagagct	atactctatg	caactgtttt	ttcccctcat	aaacaacctg	540
agttcaaatt	gaattctatc	ttccacaatc	acaatgggtg	catcacccag	tacacagaag	600
tttgaatcac	aaaacataat	taccacaata	aaacacagtg	ttcaagtatc	ttggcagagc	660
aatctgccgc	acaaactgca	aattaaatta	actacacaga	ctaaaaacta	tacagcctac	720
catcacagtt	gtgcattata	aaaaagggag	tttctttcct	ttggttttaa	gtcaggaaca	780
gggtaggatt	ttttaccctc	nggccgggga	ccacgctaaa	ggggcgaaat	ttcttgccan	840
natattccnt	tcac					854

<210> 330

<211> 299

<212> DNA

<213> Homo sapien

<400> 330

ccaatgaata	actgacttta	taatcctggg	caatcagctt	ttggcgggtt	gtaagtgcct	60
ctcgacactt	ttcactcatg	gattcttcaa	atttatgggt	aaagaggcac	ttatacactc	120
tgccctcacc	agcttgtgta	ttttcacaaa	aacgctccc	atcatctcgg	caagcaaat	180
ataaatgccg	gtctaagtga	aagtcacccg	atgacagctc	agccaccggg	agaatggctt	240
tcttgagag	ttcagaaact	tgaatcttgg	gttctctttc	ttctgcttct	ttcaccagg	299

<210> 331

<211> 573

<212> DNA

<213> Homo sapien

<400> 331

aaagatatga	acagcttaat	tttccgtgtg	attatcta	taaaaaagaa	aaacaaaaca	60
agcaaatgt	tcaagttaaa	aaaaaaacat	accgggtgag	caatgcacta	aaattatcca	120
catgaaaaca	aatggtctgt	aatcttataa	accaacatag	catttcactg	tcaacaatgt	180
gaaaatttaa	tatcttctca	aacaggcata	agatgaagaa	gtgctatttt	ttaattgtaa	240
aagggaactta	tgtaattgaa	aattacatta	taatttttca	ttccgaattg	acaaatgatt	300
tcaaaaacaa	ggatcaaagt	ttgactgcaa	atagtaattg	aatataattt	cataaaaatc	360
cttcaatttc	tatttttttc	cttttctgta	gttgacatat	gaagaccact	tcaatttcta	420
aaaaagggaa	ccattccaat	tttccctccc	caagaaaatg	tctcacaatt	acaaagtaga	480
aaaacagccg	ttcataaatg	caaaaaaatt	ctgatttata	tatgaaataa	tttctagatc	540
aattcaacat	atttgatgac	atttggtgag	ttt			573

<210> 332

<211> 555

<212> DNA

<213> Homo sapien

<400> 332

aaatttgaaa	gttgtaagca	ctgatgttaa	tgtgattgat	cagcatgggc	atatgtaaaa	60
tgtccttttc	tggttgcttc	tctatgctat	tgtgttcaga	tacttacacc	ataattaaac	120
agtaagttaa	agacttgctg	agtttgcat	agatagtgcg	ctcattta	ctgtgcctct	180
caaaacttca	gaatattagc	atattaccac	aaataatttt	tggtgaaact	attgagatat	240
taaaattttt	gaaatcacta	ctgttacctg	ttatagaaaa	tagtggtggc	ttagtctagt	300
ctctgtgtaa	ctggttacat	tttgatggtt	gtctatactc	aactggatat	gtgatgtaa	360
attagaaaat	acatacctat	ccagacataa	atgctaagta	acattttttt	cttctcccaa	420

ctacataatt tgtagctcat catttttctt taatcctttc ctaacttgtc gcagcagttt	480
gaatttccca gatatttatg tttgaacata atggctcaga atacatattt gaacatcata	540
gttgatatata ttttt	555

<210> 333

<211> 460

<212> DNA

<213> Homo sapien

<400> 333

aaatttcttt caacagtcta ttgggggtcca aaaagcatat atcaaaacaa aaataacaaa	60
agcaaaacaa aatgctacat gtaaaagcta aagaaagaaa atgcagcata ttcaggttct	120
ttttcttgag gtacctatat aaatttaatc acctgcccc aagtcctctc gttagggttaa	180
aaacacaatg cgtcctgggg agccaattgc ccggcacgtc ttattactga gaaagtgcaa	240
gaatgctgat catcttatgc agcatactaa aggatgattt actctttaca aaatagagct	300
taagtatcaa cctgatggaa gttagaaaat taaaaacatt taagtagaat catctctctc	360
tctatttttg agatcctgca gcaaaaagcc tcccaaatca actttcaaag ttctgccatt	420
aaggaatgtt ggttctcttg taaaattcag agatctcttt	460

<210> 334

<211> 190

<212> DNA

<213> Homo sapien

<400> 334

ccaaggaagg ctgtgctcta gcccatctga cctgtctgac aaaccacctg ggggacaagg	60
ctgatagaga cctgtgcaga tgtctctctc tgtgccccctc actcatctca ctggatctgt	120
ctgccaaacc tgagatcagc tgtgccagct tggaagagct cctgtccacc ctccaaaagc	180
ggccccaagg	190

<210> 335

<211> 394

<212> DNA

<213> Homo sapien

<400> 335

aaatttggac agacttctag cggacagtta cttctcaaga attttctata caaaagctgt	60
gccaggcata tattttctca ccaggacaca tggggcagcg gacctctggt gtcagtaaga	120
acacaccag aatgatataa ccagatattt ttcagtttct aaattaaggc atattcaaaa	180
aattccatgt acaagtttac accacttttc taagttactc accaggtaat taaagcagat	240
tcacagatga attactctca gtttaactat atgcaacaac catgccata acttttcttc	300
taaattttgc ataataatgg ttaaaaaaag tggtagttaa actatcatgt tcacaattgt	360
catttttcaa ggcagtagaa gaccaagaca tttt	394

<210> 336

<211> 429

<212> DNA

<213> Homo sapien

<400> 336

aaaagctatc accattgtag tagaatcatc cttctttttt gaaatttgaa gcatcccagg	60
cttaaaatct tgtgtttcag aaagacagtt tataccatga ctgcttaatt atcccccaa	120
agaccttctg attgaagtca tgtacagttc agtggcctaa attctctgcc tttttaactt	180
gctttgcaag cctactctga aaataagtta tttagtcaag ttattctcaa agatgtccca	240
gttgccctaga aaggatcaaa tggaacattt gacacacata ctcaaaaaaa tgtaactgac	300

tataaacact ttaacctaata catctgtatc aaactttcta aaaatcaaat ctcaggattg 360
 ttccacttta gagattctat gtaaagttaa tataactata cttgtcaaat agcacctatc 420
 tatgcattt 429

<210> 337
 <211> 373
 <212> DNA
 <213> Homo sapien

<400> 337
 aaagatgctg ttaatgaaca ttacggacaa ttcatggtgt ggctagttgg taacacttca 60
 gctgattttt cttatgagat ggaaaaaaa atcagccaag taagggcaca tcttcagttc 120
 atttagaagt cagcatccaa ggtaaaagaa ttctctgttg gacttgacat cactcccatc 180
 ctctgatact cgcctactct ctctcacaag aagttagtct ttcttccag tgaaatattc 240
 tccataaagt caaatgggtt ctctactctg aaaaccttgc taaaaccag ttccagcata 300
 agtctgtctg ccacaaactc aatgtattgc ttcacagag tgcaattcat cccaatgagt 360
 ttcacaggca agg 373

<210> 338
 <211> 366
 <212> DNA
 <213> Homo sapien

<400> 338
 ccattccctt atgagcgggc gcagtgatta taggctttcg ctctaagatt aaaaatgccc 60
 tagccactt cttaccacaa ggcacaccta cacccttat cccatacta gttattatcg 120
 aaaccatcag cctactcatt caaccaatag ccttgccgt acgctaacc gctaacatta 180
 ctgcaggcca cctactcatg cacctaattg gaagcgccac cctagcaata tcaaccatta 240
 accttccctc tacacttatc atcttcacaa ttctaattct actgactatc ctgaaatcg 300
 ctgtgcctt aatccaagcc tacgttttca cacttctagt aagcctctac ctgracgaca 360
 acacat 366

<210> 339
 <211> 319
 <212> DNA
 <213> Homo sapien

<400> 339
 ccttccctcc ccaccacat caacctcttc aaaacctact ccctccctct aagtatctct 60
 caacacagta tgtctggggc tagatttcaa aacccacgta atgaaaaagt cagttttaca 120
 agcctaattt tgttgttttt ttttttatat caattaacgt taaaaattgc atcaactatt 180
 taattcatga ggatctttca tattaaaatt taaccttaag attcaaccgc catgtgcttt 240
 tataaaggaa acatttttta gagacgtctg agctcacttt tacatggtgg tgcctactgc 300
 cgtaaatggt tgtgatttt 319

<210> 340
 <211> 278
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(278)
 <223> n = A,T,C or G

<400> 340

ctaataaaaat gaattaacca ctcattcatn natctaccca cccnatccaa catctccnca	60
tgatgaaach ncggctcact ccttggcgcc tgctgatcc tccaantcac cacaggacta	120
ttcctagcca tgcactactn accagacncc tcaacngcct tttnatcaat nggncacatn	180
actcganach taaatnatgg ctgaatcatc cgctacctnc acgccaatgg cagcctcaat	240
attctttatg ctgcctcttc ctacacatgc gggcgagg	278

<210> 341

<211> 400

<212> DNA

<213> Homo sapien

<400> 341

ccagcatggg gctgcagctg aacctcacct atgagaggaa ggacaacacg acggtgacaa	60
ggcttctcaa catcaacccc aacaagacct cggccagcgg gagctgcggc gccacactgg	120
tgactctgga gctgcacagc gagggcacca ccgtcctgct cttccagttc gggatgaatg	180
caagttctag ccggtttttc ctacaaggaa ttcagttgaa tacaattctt cctgacgcca	240
gagacctgc ctttaaagct gccaacggct ccctgcgagc gctgcaggcc acagtcggca	300
attcctacaa gtgcaacggc gaggagcacg tccgtgtcac gaaggcgttt tcagtcaata	360
tattcaaagt gtgggtccag gctttcaagg tggaagggtg	400

<210> 342

<211> 536

<212> DNA

<213> Homo sapien

<400> 342

aaagaacaat gggaaaaaca agtccgtgtt ctcacagatg ctgtcgatga cttacttcc	60
attgatgact tcttggctgt ctcagagaat cacattttgg aagatgtgaa caaatgtgtc	120
attgctctcc aagagaagga tgtggatggc ctggaccgca cagctgggtgc aattcgaggc	180
cgggcagccc gggctattca cgtagtcacc tcagagatgg acaactatga gccaggagtc	240
tacacagaga aggttctgga agccactaag ctgctctcca acacagtcac gccacgtttt	300
actgagcaag tagaagcagc cgtggaagcc ctcagctcgg accctgcccga gcccatggat	360
gagaatgagt ttatcgatgc ttcccgcctg gtatatgatg gcatccggga catcaggaaa	420
gcagtgtgta tgataaggac ccctgaggag ttggatgact ctgactttga gacagaagat	480
tttgatgtca gaagcaggac gagcgtccag acagaagacg atcagctgat agctgg	536

<210> 343

<211> 646

<212> DNA

<213> Homo sapien

<400> 343

aaaacttcta ttcataaaaa gacataaaga aaacagtcaa gccacagact aggtgtaata	60
tctcaataca tatatccgac aagagaattg catctagaat gtataaagaa tttctatgac	120
ccaattatag ctatcaggga tatacaaatt aaaacaaaaa tgaaacatca ctacacaccg	180
attggaatgg ttaaaaagga aaaatactga caacaccaat atttgtaaag acaggaggta	240
ccagaactct cattcattat attcataaat tgacaaatat aaaaactgct atagtagggc	300
agtcttctct agaaagggat tgtgggcagc acagagaaca atattaatct gtccattata	360
ttccttaact gtaaaatgga gaccatatgt tccaccagct tcacttggtg attatgatac	420
atggctatta agagactcaa atgactccat ttcatacaat aatatgccct gtcaattcta	480
cttctaaagt atcccatgtt ctatccaatg tcataccact atcataattt aagtgttcat	540
aactctctat aatatttcaa taatctaact ggtctcaatg cctgtagtag aaattgcaga	600
ttgggctccc caatttctgt tccctaggaa ggctgagaaa gctttt	646

<210> 344
 <211> 383
 <212> DNA
 <213> Homo sapien

<400> 344
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 aggccaagcc tatttggtga aaccatctca tgggtcttggg gacgtagacc atttttgaaa 120
 ccgtctcatg gtcttggtga cgtagaccgt ttgcttcttt aactccagcc gcggaatgac 180
 attagtggaa ccgggctagg gaactgctgg aagttcagga tgccaccacc ttgaacacct 240
 aggccaggga tccccacat gtcccgggtt tctttcttcg agagtataga accgttcatt 300
 cttgctttgt gtccattcc atctcttgaa aaaatgtagt ctttgaatgt gtgaaaatct 360
 agggacattc aatctagtct ttt 383

<210> 345
 <211> 263
 <212> DNA
 <213> Homo sapien

<400> 345
 cctccccctt ccctttgctg gtgggaggag ctggtgtgct ccttggccgc ttactggaag 60
 ggcgtttttc agagctgcag ggacaggggtg agcagctgaa gggctaggag ggaagccggc 120
 ccccgctctg cagaagctgc atttcagctg aatctgtgtt tcagcctcag ttggttgac 180
 cgttagcccc tctcctccc gatggctatg tttttgtcac attagagaat aaacagccac 240
 acacacattt ttttttttcc ttt 263

<210> 346
 <211> 132
 <212> DNA
 <213> Homo sapien

<400> 346
 aaatccaaat acaaaagcat agtctctgca agattttggt ctttgaattt cttgatattg 60
 taattgatta ttgataactg tcattcatgaa attatctctc aataataaga taaataaact 120
 agcatatgaa tc 132

<210> 347
 <211> 564
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(564)
 <223> n = A,T,C or G

<400> 347
 cctgggtatc cagggaggct ctgcagccct gctgaagggc cctaactaga gttctagagt 60
 ttctgattct gtttctcagt agtcctttta gaggcttgct atacttggtc tgcttcaagg 120
 aggtcgacct tctaattgat gaagaatggg atgcatttga tctcaagacc aaagacagat 180
 gtcagtgggc tgctctggcc ctggtgtgca cggtgtggc agctgttgat gccagtgtcc 240
 tctaactcat gctgtccttg tgattaaaca cctctatctc ccttgggaat aagcacatac 300
 aggttaagc tctaagatag ataggtgttt gtccttttac catcgagcta cttcccataa 360
 taaccacttt gcatccaaca ctcttcaccc acctccata cgcaagggga tgtggatact 420
 tggcccaaag taactggtgg taggaatctt agaaacaaga ccacttatac tgtctgtctg 480

aggnagaaga taacagcagc atctcgacca gcctctgcct taaaggaaat ctttattaat 540
 cacgtatggg tcacaagata attc 564

<210> 348

<211> 321

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(321)

<223> n = A,T,C or G

<400> 348

gcncatgaac anggagcaac ganaagagat gtcgggctaa gggcccgga cgggcggcac 60
 ccatcctgcn acggaacacn ttcggttnt ggttttgatt ngttcacctc tgtttatatg 120
 canctatttg ntccctcctc cccacccag nccccaaact catgcttntc ttccgcncctc 180
 agcncctctg cctgtctc gcggtgagtc antgaccacn gnttccctc cangagccgc 240
 cgggcgtgag acncngacc tcnntgcata caccaggccg ggcccnngct ggctccccc 300
 gnggcctgt gaaanagctg g 321

<210> 349

<211> 255

<212> DNA

<213> Homo sapien

<400> 349

ccatgacagt gaaggggctg ttaggaatat caacaccacc gaagcgcaca tagatcacat 60
 atgtgcccgg cttggcagct gtgtagaaga tgtcataggt tccatcttca ttctaatga 120
 catcggtctc ggcctcagtg ccatctgggg tcagaaccgt gcaggtcact ttacccttcc 180
 cggcagttt ggcatacaacc acaaagccta cttcttcgcc agttttcaca gtggaggcga 240
 ttccaggacc cgtag 255

<210> 350

<211> 496

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(496)

<223> n = A,T,C or G

<400> 350

gggcttattn gtcacaaaa tcattcnctt ttggaactat ggccaattga agctacacac 60
 tgaatttatt aatacagcat taagtttctt tgtgtnaaaa aatctttgtn cncagtaata 120
 aaaaaagata aggcaagatg cattaacat gaaaccttct ggctcttttc ctctgcgttt 180
 ttacagagcc actgatgact atctgcaaca aaagagttaa gtttctgatt ttccgtatca 240
 agcatcttat gcctttgctg tggtagaagt tctggccaag caccctgaag gacagatgct 300
 ggtgatggnc tttggcactt atgctggcaa actgagcttc tttcccttga gtacttttgn 360
 aatgtacaag tagaagaagt cacaagtata ggatggctctg gactacgccg gccaccacag 420
 caatgaggtc aaagaagccc tcaaagnaga agcgnccaga tccagttgac aagatacaaa 480
 gcacgataga ggccca 496

<210> 351

<211> 109
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(109)
 <223> n = A,T,C or G

<400> 351
 ccatagtgaa gcctgggaat gagggttact gcagcatctg ggctgccanc cacaggaag 60
 ggccaagccc catgtagccc cagtcactct gccagcccc gcctcctgg 109

<210> 352
 <211> 384
 <212> DNA
 <213> Homo sapien

<400> 352
 ccttcgagag tgacctggct gccaccagg accgtgtgga gcagattgcc gccatcgac 60
 aggagctcaa tgagctggac tattatgact caccagtggt caacgcccgt tgccaaaaga 120
 tctgtgacca gtgggacaa ctggggggccc taactcagaa gcgaaggga gctctggagc 180
 ggaccgagaa actgctggag accattgacc agctgtactt ggagtatgcc aagcgggctg 240
 cacccttcaa caactggatg gagggggccc tggaggacct gcaggacacc ttcattgtgc 300
 acaccattga ggagatccag ggactgacca cagcccatga gcagttcaag gccacctcc 360
 ctgatgccga caaggagcgc ctgg 384

<210> 353
 <211> 345
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(345)
 <223> n = A,T,C or G

<400> 353
 ccttggtcag gatgaagtng gctgacacac cttagcttgg ntttgcttat tcaaaagana 60
 aaataactac acatggaaat gaaactagct gaagcctttt cttgttttan caactgaaaa 120
 ttgnaacttg ncaactttgt gcttgaggag gccattttc tgcttggcag ggggcaggta 180
 tgtgccctcc cgctgactcc tgcgtgtgcc tgagggtgat ttcctgttgn ncacacaang 240
 gccangntcc attctccctc ccttttcacc agngccacan cctnntctgg aaaaangacc 300
 agnggtcccg gaggaaccca tttgngctct gcttggacag canag 345

<210> 354
 <211> 712
 <212> DNA
 <213> Homo sapien

<400> 354
 ccattctaaa tagcatcaat ggtgccatca cccagttctc ttgcaacatc tcccacctca 60
 gcagcctgat cgctcagcta gaagagaagc agcagcagcc caccagggag ctccctgcagg 120
 acattgggga cacattgagc agggctgaaa gaatcaggat tcctgaacct tggatcacac 180
 ctccagattt gcaagagaaa atccacattt ttgccccaaa atgtctattt ttgacggaga 240

gtctaaagca gttcacagaa aaaatgcagt cagatatgga gaaaatccaa gaattaagag	300
aggctcagtt atactcagt gacgtgactc tggaccacaga caggccctac cccagcctga	360
tcctctctga taatctgcgg caagtgcggg acagttacct ccaacaggac ctgcctgaca	420
accccgagag gttcaatctg tttccctgtg tcttggtctc tccatgcttc atcgccggga	480
gacattattg ggaggtagag gtgggagata aagccaagt gaccataggt gtctgtgaag	540
actcagtgtg cagaaaagg ggagtaacct cagccccca gaatggattc tgggcagtgt	600
ctttgtggta tgggaaagaa tattgggtct ttacctcca atgactgcc taccctgctg	660
gacccgcgtc cagcgggtgg gggattttct tggactatga tgctggggga gg	712

<210> 355

<211> 385

<212> DNA

<213> Homo sapien

<400> 355

cctcatagcc gcttagcaca gttacagaat gtctgaagg gacagtgtgg gagaatccgt	60
ccatgggaaa ccttcggtgg tgtacagatt tttcacaga cttggacaga tttatcagtc	120
ctggctagac aagtccacac cctacacggc tgtgcgatgg gtcgtgacac tgggcctgag	180
ctttgtctac atgattcgag tttacctgct gcagggttgg tacattgtga cctatgcctt	240
ggggatctac catctaaatc ttttcatagc ttttcttct cccaaagtgg atccttcctt	300
aatggaagac tcagatgacg gtccctcgct acccaccaaa cagaacgagg aattccgccc	360
cttcattcga aggtcccg agttt	385

<210> 356

<211> 347

<212> DNA

<213> Homo sapien

<400> 356

aaatgagata aagaaagtct ccttttgttt ttagatggaa aagaaagcac aagtttttc	60
tacctgtgaa tgaactttgg tgacctatat gtgccattca tgcagcattt ttgttcatat	120
tggcttagaa ttcagtgcatt gaatatcatt acattcttat atctaacatt cctagttagc	180
tttgattcaa aatatacaaa atctgataca tgaatacttt gctagattaa tgacttgatc	240
atctttggaa tgagtaggca agacgatttt tacctattat ttctatgttg tgggtaatgt	300
taaaactaaa tacagatgat aataattgct atttcacagt gatgttt	347

<210> 357

<211> 313

<212> DNA

<213> Homo sapien

<400> 357

aaagtaatca acctctctgt ccttccattt gtctggatcg tctaaagatt gttttatatt	60
tagaggctca tccggtcaga tgtagtgat gtgaaatttc aggccaggcg tgacgtcagc	120
gtggcatttg aaacagctcc atgttgccct tagtgctgtc tgaccgaagc ctgtctgtcc	180
tcagatataa agatgaagcg cagctgtata aagaagagca cctgaggaat cggcagcacc	240
ctcactgcta cgttcagtac atgatcgcca tcatcaaaa ctgccagacc ttcaaggaa	300
ccatagtcag ttt	313

<210> 358

<211> 403

<212> DNA

<213> Homo sapien

<400> 358

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aaaaagaagg acttaggggtg tcgttttcac atatgacaat gttgcattta tgatgcagtt      60
tcaagtacca aaacgttgaa ttgatgatgc agttttcata tatcgagatg ttcgctcgtg      120
cagtactgtt ggtaaataga caatttatgt ggattttgca tgaatacac agtgagacac      180
agtaatttta tctaaattac agtgcagttt agttaatcta ttaatactga ctgagtgtct      240
gcctttaaat ataaatgata tgttgaaaac ttaaggaagc aaatgctaca tatatgcaat      300
ataaaatagt aatgtgatgc tgatgctgtt aaccaaaggg cagaataaat aagcaaaatg      360
ccaaaagggg tcttaattga aatgaaaatt taattttgtt ttt                        403

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<210> 359

<211> 411

<212> DNA

<213> Homo sapien

<400> 359

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aaataaatac ttagaacacg acttggtccc tacaagcacc tggactctag gtctcagtag      60
tggagtgtct caccocatggg cccacgcag ggacgccacg gttccctccc accccgtgat      120
caagacacgg aatcggtgct cgatgggttg atcgcaatgc gccctttttc tagagccttc      180
ccgggccatc tacaggcagg atcggtgttg gaaaaagaca actggaattt ctggaaggtt      240
gatggtccgc acggttgagg attctacgtg gttctcttgg ttccctgggt gtgtgtgtgt      300
gtggaggagg ccgcggccct tagatcacct tcttgagctc gtcgtacagg accagcacga      360
aggcgccccc catgccccgc aggacgttgg accacgcacc cttgaagaag g                        411

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<210> 360

<211> 378

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (378)

<223> n = A,T,C or G

<400> 360

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cctcttcagg ggcccagacc agggacaggg ccttggtttc cttctccctg gcttctgcct      60
cagctctgtc cctctcatcc gcgtatttgg aagagatggt tttctcctcg gctaacaact      120
gatcaaattt cctctgcttc tttccaggt tggacacgag ttgccgctgg ttgtccaaat
180caacaaccag gtgctccagc tctgctgaa gcctgttctt ggtcttttcc agtttatcat
240
aagcggcgcg cttctcctcg tactgctggg tgagntctc gatctccttc tggaacctct      300
tcttcccttc ttccagagct tccacgngc tggcaaagtc ctgcagcttc ttcttcgagt      360
cggagagctg gatgttga                        378

```

<210> 361

<211> 372

<212> DNA

<213> Homo sapien

<400> 361

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aaataactgg ggccattaag agtggatgta gctaagagct tagctaacat tgccttttca      60
ctctattttt ctgagatatt gtaagcattc tgtttttcaa tattgtagtt aatttttttg      120
ctttcaacag cagccctagt aatgggtggg ttgttaatta atgtgtatat tgtactgaat      180
ttctgtcagt taaggggttc actgctttgg tggaaattgg tggaaattgc tagcaggttc      240
cacgatgttt atttttttct ccatgttgta tatcattacc atttcacata cgcgtttcta      300
tttttcttcc tctcctcctg atctccttaa aatgaatct agagttgggt gctttttccc      360
ctcctctttt gg                        372

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<210> 362
 <211> 544
 <212> DNA
 <213> Homo sapien

<400> 362
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 tgcctctctc aggacaacag ttccaattcc aaggagccta cctgagggtcc ctactctcac 120
 tggggtcccc aggatgaaaa cgacaatgtg ccttttttatt attattttatt tgggtggctct 180
 gtgttatttta agagatcaaaa tgtataacca cctagctctt ttcacctgac ttagtaataa 240
 ctacatactaa ctggttttga tgcctgggtt gtgacttcta ctgaccgcta gataaacgtg 300
 tgcctgtccc ccagggtggt ggaataattt acaatctgtc caaccagaaa agaattgtgtg 360
 tgtttgagca gcattgacac atatctactt tgataagaga cttcctgatt ctctagggtc 420
 gttcgtggtt atcccattgt ggaaattcat cttgaatccc attgtcctat agtcctagca 480
 ataagagaaa tttcctcaag tttccatgtg cggttctcct agctgcagca atactttgac 540
 attt 544

<210> 363
 <211> 328
 <212> DNA
 <213> Homo sapien

<400> 363
 aaactggtta tgacaaaagc ctttagttgt gtttcttgaa ctataaagaa aacaaatttt 60
 ggcagtcctt aagtatatat agcttaaat ataattttta gcatttggca ccatatgtat 120
 gccattatat ttgattttgc attactgttt cacaatgaag ctttctttaa ggctttgatt 180
 tttatgatta tgaaagaaat aaggcacaac cacagttttt ctttcttaaa tttcatcact 240
 gttgatgtgg ttcttttgtg ttaaaaaaaa aaagtgaac tatcaaaact aaaaaattat 300
 agagtaatat tgccgttctg ctgatttt 328

<210> 364
 <211> 569
 <212> DNA
 <213> Homo sapien

<400> 364
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 tatctcacta ctttagtttag ttgtctcctt tgggcctggg cacagtcttg gccctgatct 120
 ggaacagact cccttttcta aaactgaact tgaccacatc aaaagtttgt aaaacaatct 180
 ccatggtaat taaacttgca ttcaacacca tatggtaaca gaagatggca aaggataaga 240
 ttcagatctt agatctttcc aagtagggca tgttagatga tagaaggatt agttgcaagc 300
 tggatctgag ctacaggcttg ggcattgaagg aaactgtctc ccatgtgggt tggaaagagt 360
 aggggctccc tgagctctat tgtgaactat acgggtttca tccaaggaat ggtatgatgt 420
 gggcataaaa ccattcttca gacaactgaa gatgggtccc ttctgtagcc agaaacacta 480
 gctgtcctgc attgtccatt tccttttagcc ccaggcgggt ctgtgtgtac agggaggtct 540
 cctgtaaggg aatggtttcc ttggcttgg 569

<210> 365
 <211> 151
 <212> DNA
 <213> Homo sapien

<400> 365
 aaaaaaaaa atccttttat tatggaattt gtcaaacaca cacacaagca taacaaaccc 60

ctaggtaccc atctccaagt tttgacccct attataattt catcttcagt gttttattat 120
ccacttcctc tctctctatc tttagtattt t 151

<210> 366

<211> 508

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (508)

<223> n = A,T,C or G

<400> 366

agtataaaga tatattccat aaaagagttt ggcagtc aaa ganaagcatc gcacttccga 60
aaaacacaag cattcttctc ctagtctaca gagaattgng taaaaaaaaa aaaaaatcat 120
catcaacagc cncantnta cncacacta gaagtacac tccggcaagt aaattaaggn 180
tgcagtccat ccctgaacga tganaagngg tctgagctat gycaaaagngt tanaaaagtag 240
cccagctana caaatgcccc agctatcccc aggggaggtta ttcagtactt aanacttcat 300
ttccaananc agccccggaa aagccctgac aggaaggggg gaccagngat caccgatntc 360
ccattagggg cggncaccaa aaacaaaatg cctggagctt ntgagcagct gcagcctggg 420
gttgtggcta ggcncnggn gnggttgcaa aaaaacggct gtntccgggg agaggcaaat 480
ggcaggccag ccagccctgg gtacatgg 508

<210> 367

<211> 382

<212> DNA

<213> Homo sapien

<400> 367

cctgagcggc tagtctttaa gatgcgcttc tategtttgc tgcaaatccg agcagaagcc 60
ctcctggcgg caggcagcca tgtgatcatt ctgggtgacc tgaatacagc ccaccgcccc 120
attgaccact gggatgcagt caacctggaa tgctttgaag aggacccagg gcgcaagtgg 180
atggacagct tgctcagtaa cttgggggtgc cagtctgect ctcatgtagg gcccttcac 240
gatagctacc gctgcttcca accaaagcag gagggggcct tcacctgctg gtcagcagtc 300
actggcgccc gccatctcaa ctatggctcc cggcttgact atgtgctggg ggacaggacc 360
ctggtcatag acacctttca gg 382

<210> 368

<211> 174

<212> DNA

<213> Homo sapien

<400> 368

ctttctcct ctttgacaag gatggagatg gcactatcac caccaaggag ttggggacag 60
tgatgagatc cctgggacag aacccactg aagcagagct gcaggatag atcaatgagg 120
tggatgcaga tgggaacggg accattgact tcccggagtt cctgaccatg atgg 174

<210> 369

<211> 216

<212> DNA

<213> Homo sapien

<400> 369

aaatctcatg ggttctatta aaaaaatata tatatagggc cccaatccat tgccatcaaa 60

ttgcccttgg acttttccaa ggtatattat ggggttttat gcaaaattcc aagctaccat	120
gtaacttttt ttaaccattt aacaaggagg gggaactgtt tcctaccttc tttacatgtt	180
gtgcattgtt gtggtccaga aatgccaaac cttttt	216

<210> 370

<211> 344

<212> DNA

<213> Homo sapien

<400> 370

ccttggtcag gatgaagttg gctgacacag cttagcttgg ttttgcttat tcaaaagaga	60
aaataactac acatggaaat gaaactagct gaagcctttt cttgttttag caactgaaaa	120
ttgtacttgg tcacttttgt gcttgaggag gccattttc tgctggcag ggggcaggtc	180
tgtgacctcc cgctgactcc tgctgtgtcc tgagggtgcat ttctgttgt acacacaagg	240
gccaggctcc attctcctc cctttccacc agtgccacag cctcgtctgg aaaaaggacc	300
aggggtccc gaggaacca tttgtgctct gcttgacag cagg	344

<210> 371

<211> 741

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(741)

<223> n = A,T,C or G

<400> 371

aaattacata tctaattgtg tgatttgta aatgccatt tcttcattca agtgctaagt	60
gctaagtgtg gcagtttggt cctgctaca ctccaaggca caaaggaggt caaggatgt	120
gcaatggaaa tcagtttagat gaatgtgta ggaaccttcc ctttaataaa gctggatccc	180
acactagccc ctacacctc tcataccaa atattcctgc ttctctcac ctgcacttgc	240
tgctctctcc tctgccacac aaatctacct ctcaagccta ggtcccaact gcttcattgc	300
aactttccag actattccag aacctttaac catctctgac ctctcatcag atctatgttg	360
tacataacac caattaatga gatcattact gctttatgct ctaattgctt cctgtattca	420
aaatcttctc tccaaccaca taatgactcc cttaaacttct cttgtatttt ccaatgcctt	480
gtacaagcac agaactggtc aatcaataaa tactcactgg ttatttgagg aaaaaatgtt	540
gccaaagcacc atctttatca gaaaataaat caattcttct aaacttggag aaatcacctt	600
attcctagta tgtgatctta attagaacaa ttcagattga gaangngaca gcatgctggc	660
agtcctcaga gccctcgtt gctctcgna cctccctgcc tgggctccca ctttgggtggc	720
atttgaggag cccttcagcc t	741

<210> 372

<211> 218

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(218)

<223> n = A,T,C or G

<400> 372

ccgccagtgt gctggaattc gcccttggcc gcccgggcag gtaccacaac agcaggngctg	60
--	----

agtgagaaat ctaccacctt ctacagtagc cccagatcac cggacacaac actctcacct	120
gccagcacga caagctcagg cgtcagtga gaatccacca cctcccacag ccgaccaggc	180
tcaacgcaca caacagcatt cctggcagt accttggg	218

<210> 373
 <211> 168
 <212> DNA
 <213> Homo sapien

<400> 373	
actgctaggg aatgctgttg tgtgcattga gcctggctgg ctgtgggagg tgggtggattc	60
ttcactgacg cctgagcttg tctgtctggc aggtgagagt gttgtgtccg gtgatctggg	120
gctactgtag aaggtggtag atttctcact caggcctgct gttgtggt	168

<210> 374
 <211> 154
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(154)
 <223> n = A,T,C or G

<400> 374	
tgagaaatct accaccttct acagngagcc ccanatcacc ggacacaaca ctctcacctg	60
ccagcacgac aagctcaggc gtcagtgaag aatccaccac ctcccacagc cgaccaggct	120
caacgcacac aacagcattc cctggcagta cctc	154

<210> 375
 <211> 275
 <212> DNA
 <213> Homo sapien

<400> 375	
actgccaggg gacagtgttg tgtcagttga acctgggctg ctgtgggaag ttgttgattc	60
ctgactgggg cctgaggttg tgggtctggc aggtaacagt gttgtatccg ttgagcctgg	120
gctgctgttg gaagttgtag aatgccgact gaggcctggc gtggtggtgc tgtcagggaa	180
tgctgttggtg tgcgttgagc ctggctggct gtgggaggtg gtggattctt cactgacgcc	240
tgagcttgct gtgctggcag gtgagagtgt tgtgg	275

<210> 376
 <211> 191
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(191)
 <223> n = A,T,C or G

<400> 376	
actgccaggg gacagtgttg tgtcagttga acctgagctg ctgtgggaag ttgttgattc	60
ctgactggag cctgaggttg tgggtctggc aggtaacagt gttgtatccg ttgagcctgg	120
gctgctgttg gaagttgtag aatgccgact gaggcctgcc gtggtggtgc tgnatgggaa	180

tgctgctagc g

191

<210> 377

<211> 476

<212> DNA

<213> Homo sapien

<400> 377

```

ccgccagtgt gctggaattc gcccttgccc gcccgggcag gtacatttcc ttgtagactc      60
tgtaatttc ctgcagctcc tgggttggtc tggagcagat gatctcaatg agagagtcct      120
cgtcggttcc cagccccttc atggaagctt ttagctcaga agcgtcatac tgagcaggtg      180
tcttcaatag gcccaaatc accgtctcca ggtggccaga taaggctgac ttcagtgtg      240
atgcaagttc ctttttggtc cttctctggt aggcgaaggc aatatacctg ctctgtgcat      300
tgctgcggtt ggtcaaatg ttgacaatgg tgacctcacc cacacctttg gtcttgatgg      360
ctgtttcaat gttcaagca tcccgctcag catcaaatg agtataggct ttgacagacc      420
catatgcact tgggggtgta gagtgatcac cctccaagcc gagcttgcac aggatt      476

```

<210> 378

<211> 455

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(455)

<223> n = A,T,C or G

<400> 378

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agtgctgtgg aattcgccct tggccgccc ggcaggtaca catcccatct tcaaatttaa      60
aatcatattg tcagttgtcc aaagcagctt gaatttaaag tttgtgctat aaaattgtgc      120
aaatatgtta aggattgaga cccaccaatg cactactgta atatttcgct tcctaaattt      180
cttccacctt cagataatag acaacaagtc tgagaaacta aggctaacca aacttagata      240
taaactctac caataaaatt tttcagtttt aagttttaca gtttgattta aaaacaaaac      300
agaaacaaat ttcaaaataa atcacatctt ctcttaaaac ttggcaaacc cttccctaac      360
tgtccaagtn tgagcataca ctgccactgg ctttagatac tccaatttaa tgcactactc      420
tttacttggt ctgaatgaag tatggtgaaa caagc      455

```

<210> 379

<211> 297

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(297)

<223> n = A,T,C or G

<400> 379

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agctcggatc cctagnacgg ccgccagtgt gctggaattc gcccttagcg gcggccccgg      60
caggtacaaa gaatccttag acgccatact gagttttaag ttccttaatt cctaatttaa      120
ggcttctagt gaagcctcct cacagtaggc ttcactaggc ccacagtgcc cctagacctc      180
tgacaatccc accctagaca gactttattg caaaatgcgc ctgaagaggc agatgattcc      240
caagagaact caccaaatca agacaaatgt cctagatctc tagtgtgna gaactat      297

```

<210> 380

<211> 144

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(144)

<223> n = A,T,C or G

<400> 380

actttgctga aaattctttt tcccagggtc tataaaacat taatttggtt ttatatatta	60
ctattttttt gngttttttt gtttttaaat caataagtaa tctaggacta gcattatgtt	120
tgctagacct ggcatttgct cggc	144

<210> 381

<211> 424

<212> DNA

<213> Homo sapien

<400> 381

actcttgaat acaagtttct gataccactg cactgtctga gaatttccaa aactttaatg	60
aactaactga cagcttcctg aaactgtcca ccaagatcaa gcagagaaaa taattaattt	120
catgggacta aatgaactaa tgaggataat attttcataa ttttttattt gaaattttgc	180
tgattcttta aatgtcttgt tcccagatt tcaggaaact ttttttcttt taagctatcc	240
acagcttaca gcaatttgat aaaatatact tttgtgaaca aaaattgaga catttacatt	300
ttctccctat gtggctgctc cagacttggg aaactattca tgaatattta tattgtatgg	360
taatatagtt attgcacaag ttcaataaaa atctgctctt tgtataacag aatacatttg	420
aaaa	424

<210> 382

<211> 408

<212> DNA

<213> Homo sapien

<400> 382

actcttgaat acaagtttct gataccactg cactgtctga gaatttccaa aactttaatg	60
aactaactga cagcttcctg aaactgtcca ccaagatcaa gcagagaaaa taattaattt	120
catgggacta aatgaactaa tgaggataat attttcataa ttttttattt gaaattttgc	180
tgattcttta aatgtcttgt tcccagatt tcaggaaact ttttttcttt taagctatcc	240
acagcttaca gcaatttgat aaaatatact tttgtgaaca aaaattgaga catttacatt	300
ttctccctat gtggctgctc cagacttggg aaactattca tgaatattta tattgtatgg	360
taatatagtt attgcacaag ttcaataaaa atctgctctt tgtatgac	408

<210> 383

<211> 455

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(455)

<223> n = A,T,C or G

<400> 383

actcttgaat acaagtttct gataccactg cactgtctga gaatttccaa aactttaatg	60
---	----

```

aactaactgn cnncttcacg aaactgtcca ccaagatcaa gcagagaaaa taattaattt 120
catgggacta aatgaactaa tgaggataat attttcataa ttttttattt gaaattttgc 180
tganncttta aatgtcttgt ttcccagatt tcaggaaact ttttttcttt taagctatcc 240
acagcttata gcaatttgat aaaatatact tttgtgaaca aaaattgaga catttacatt 300
ttctccctat gtggtcgctc cagacttggg aaactattca tgaatattta tattgtatgg 360
taatatagtt attgcacaag ttcaataaaa atctgctctt tgtataacag aatacatttg 420
aaaacattgg ttatattacc aagactttga ctaga 455

```

<210> 384

<211> 376

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (376)

<223> n = A,T,C or G

<400> 384

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actcttgaat acaagggtct gatatactg cactgtctga gaatttccaa aactttaatg 60
aactaactga cagcttcacg aaactgtcca ccaagatcaa gcagagaaaa taattaattt 120
catgggacta aatgaactaa tgaggataat attttcataa ttttttattt gaaattttgc 180
tgattcttta aatgtcttgt ttcccagatt tcaggaaact ttttttcttt ttaagctatc 240
cacagcttac agcaatttga taaaatatac ttttgngaac aaaaattgag acatttacat 300
tttctcccta tgtgggcgct ccagacttgg gaaactattc atgaatattt atattgnatg 360
ggaatatagc attgcc 376

```

<210> 385

<211> 422

<212> DNA

<213> Homo sapien

<400> 385

```

acctgtgggt ttattaccta tgggtttata tcttcaaata cgacattcta gtcaaagtct 60
tggtaatata accaatgttt tcaaattgat tctgtcatat aaagagcaga tttttattga 120
acttgtgcaa taactatatt accatacaat ataaatattc atgaatagtt tccaagtct 180
ggagcgacca catagggaga aaatgtaaat gtctcaattt ttgttcacaa agtatattt 240
tatcaaattg ctgtaagctg tggatagctt aaaagaaaaa aagtttcctg aaatctggga 300
aacaagacat ttaaagaatc agcaaaattt caaataaaaa attatgaaaa tattatcctc 360
attagttcat ttagtcccat gaaattaatt attttctctg cttgatcttg gtggacagtt 420
tc 422

```

<210> 386

<211> 313

<212> DNA

<213> Homo sapien

<400> 386

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caagtaggtc tacaagacgc tacttccctc atcatagaag agcttatcac ctttcatgat 60
cacgcctca taatcatttt ccttatctgc ttctagtcc tgtatgccct tttcctaaca 120
ctcacaacaa aactaactaa tactaacatc tcagacgctc aggaaataga aaccgtctga 180
actatcctgc ccgccatcat cctagtcttc atcgccctcc catccctacg catcctttac 240
ataacagacg aggtcaacga tccctccctt accatcaaat caattggcca ccaatgggtac 300
tgaacctacg agt 313

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<210> 387
 <211> 236
 <212> DNA
 <213> Homo sapien

<400> 387
 cgccctcata atcattttcc ttatctgctt cctagtcctg tatgcccttt tcctaact 60
 cacaacaaaa ctaactaata ctaacatctc agacgctcag gaaatagaaa ccgtctgaac 120
 tatcctgccc gccatcatcc tagtcctcat cgccctccca tccctacgca tcctttacat 180
 aacagacgag gtcaacgata cctcccttac catcaaatca attggccacc aatgg 236

<210> 388
 <211> 195
 <212> DNA
 <213> Homo sapien

<400> 388
 acgccctttt cctaactctc acaacaaaaa taactaatat taacatctca gacgctcagg 60
 aaatagaaac cgtctgaact atcctgcccg ccatcatcct agtcctcctc gccctcccat 120
 ccctacgcat cctttacata acagacgagg tcaacgatcc ctcccttacc atcaaatcaa 180
 ttggccacca atgg 195

<210> 389
 <211> 183
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(183)
 <223> n = A,T,C or G

<400> 389
 taacactcac aacaaaaacta actaatata nnatctcaga cgctcaggaa atagaaaccn 60
 cctgaactat cctgcccgcg atcctcctag tctcctcgc cctcccatcc ctacncatcc 120
 ttacataac agacgaggtc aacgatccct ccttaccat caaatcaatt ggccaccaat 180
 ggt 183

<210> 390
 <211> 473
 <212> DNA
 <213> Homo sapien

<400> 390
 acaaagcagc aactgcaata ctcaaggtta aaacattaga aaagcatttg tgtgacaggt 60
 atattacagt attatcaaaa tattacattt tcagacttac tttagcagata atcatccacc 120
 agagcttaaa tctttaaatt atttccatag tcttaaaaaa tatgtaatgt cagaatgcat 180
 ataaaaagaa tgtaaaagga aacctaaaat acaaatggaa taatgtaaca aataaatatt 240
 tgatttcagt aactgttaat aatcagctca acaccaccat tctctctaaa ctcaatttaa 300
 ttcttatagg aataatgaac tgtcaaatgc catggcataa ttattttatt ccaagctatc 360
 atcaatgatt agaactaaaa aaaatttggc ataaaaaaat cacaattcag cataaataaa 420
 gctattttta gcttcaacac tagctagcat ctctaagaat tgttgaaata agt 473

<210> 391
 <211> 216

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(216)

<223> n = A,T,C or G

<400> 391

atttgtat	ttt taggtttcct	ttt tacattct	ttttat	atgc nntctg	acat tacat	at	60
tttaagact	at ggaaataatt	taaagatt	ta agctct	gggtg gatg	attatc tgcta	agtaa	120
gtctgaaa	at gtaatat	ttt gataat	actg taatata	cctg gtcacaca	aa tgcttt	tcta	180
atgtttta	aac cttgagt	att gcagtg	ctg cttt	gt			216

<210> 392

<211> 98

<212> DNA

<213> Homo sapien

<400> 392

acttattt	ca acaatt	ctta gagat	gctag ctagt	gttga agcta	aaaaat agcttt	at	60
atgctga	att gtgatt	tttt tatg	ccaaat ttttt	taa			98

<210> 393

<211> 397

<212> DNA

<213> Homo sapien

<400> 393

tgccgat	ata ctctag	atga agtttt	acat tgttg	agcta ttgct	gttct cttgg	gaact	60
gaactc	actt tcctc	ctgag gcttt	ggatt tgacatt	gca tttgac	cttt tatgt	agtaa	120
ttgacat	gtg ccaggg	caat gatga	atgag aatct	acccc cagat	ccaag catct	gagc	180
aactctt	gat tatcc	atatt gagt	caaatg gtagg	cattt cctat	cacct gtttc	cat	240
aacaag	agca ctacatt	cat ttagc	taaac ggatt	ccaaa gagta	gaatt gcatt	gaccg	300
cgacta	attt caaaat	gctt tttatt	atta ttatt	tttta gacagt	tctca ctttg	tcgcc	360
caggcc	ggag tgcagt	ggtg cgatct	caga tcagt	gt			397

<210> 394

<211> 373

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(373)

<223> n = A,T,C or G

<400> 394

ttacatt	gtt gagct	atttgc tgttct	cttg ggaact	gaac tcact	ttcct cctg	aggctt	60
tggattt	gac attgc	atttg accttt	atg tagta	attga catgt	gccag ggcaat	gatg	120
aatgaga	atc tacc	cccaga tccaag	catc ctgag	caact cttg	attatc catatt	gagt	180
caaattg	tagt gcattt	cccta tcacct	gttt ccatt	caaca agagc	actac attcat	ttag	240
ctaaac	ggat tccaa	agagt agaatt	gcat tgacc	acgac tantt	tcaaa atgct	tttta	300
ttattat	tatt ttttt	agaca gtctc	acttt gtcg	cccagg ccggag	tgca gtggt	gcgat	360
ctcagat	cag tgt						373

<210> 395
 <211> 411
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(411)
 <223> n = A,T,C or G

<400> 395
 actgatcatt ctatttcccc ctctattgat cccacacctc aaatatctca tcaacaaccg 60
 actaatcacc acccaacaat gactaatcaa actaacctca aaacaaatga taaccataca 120
 caacactaaa ggacgaacct gatctcttat actagtatcc ttaatcattt ttattgccac 180
 aactaacctc ctgggactcc tgcctcactc atttacacca accacccaat tatctataaa 240
 cctagccatg gccatcccct tatgagcggg cgcagtgatt ataggctttc gctctaagat 300
 taaaaatgcc ctagcccact tcttacngca aggcacacct acaccctta tccccatact 360
 agttattatc gaaacatca gcctactcat tcaaccaata gccctggccg t 411

<210> 396
 <211> 411
 <212> DNA
 <213> Homo sapien

<400> 396
 actgatcatt ctatttcccc ctctattgat cccacacctc aaatatctca tcaacaaccg 60
 actaattacc acccaacaat gactaatcaa actaacctca aaacaaatga tagccataca 120
 caacactaaa ggacgaacct gatctcttat actagtatcc ttaatcattt ttattgccac 180
 aactaacctc ctgggactcc tgcctcactc atttacacca accacccaac tatctataaa 240
 cctagccatg gccatcccct tatgagcggg cgcagtgatt ataggctttc gctctaagat 300
 taaaaatgcc ctagcccact tcttaccaca aggcacacct acaccctta tccccatact 360
 agttattatc gaaacatca gcctactcat tcaaccaata gccctggccg t 411

<210> 397
 <211> 351
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(351)
 <223> n = A,T,C or G

<400> 397
 ngccgangta caaaaaaaag cacattccta gaaaaaggta ttggcaaata gtaaaaatgg 60
 gaggtcaaaa ncaaaaaaaa aaaaaacaaa acnaaaaaaa gaaaaaacca acaattcttc 120
 aattcagtgt gcaaacatta tataaaaaata gaaatactaa ctctacaggc agtatttcct 180
 gataaattat ttaaatagca tatctacnca atctgagata tctattccaa tggcaatgag 240
 aaaataattt ataaaaataa agcaatggta taccanatga tagaaaaaaa cataactttc 300
 agaaattgta tttacattt caatgctatt tccttattgn gaatncttct c 351

<210> 398
 <211> 363
 <212> DNA

<213> Homo sapien

<400> 398

acaaaaaaaa	gcacattcct	agaaaaaggt	attggcaaat	agtaaaaatg	ggaggtcaaa	60
agcaaaaaaa	aaaaaaaaaa	aacaaaaaaaa	agaaaaaacc	aacaattctt	caattcagtg	120
tgcaaacatt	atataaaaat	agaaatacta	actctacagg	cagtatttcc	tgataaatta	180
tttaaatagc	atatctacac	aatctgagat	atctattcca	atggcaatga	gaaaataatt	240
tataaaaata	aagcaatggg	ataccagatg	atagaaaaaa	acataacttt	cagaaattgt	300
atttaacatt	tcaatgctat	ttccttattg	ggaatacttc	tctgcagagt	ttttatgcta	360
tgt						363

<210> 399

<211> 360

<212> DNA

<213> Homo sapien

<400> 399

actgtttcct	cgtggttcag	gggtgtgcat	gaaggctctt	aggagagcaa	acacctgttc	60
ctattctgta	tgccctccc	tcatttcaaa	tgagagtaac	caattgagta	aaataaccaa	120
ataaccattg	ccccaccatg	aacatggggc	ttgggaagac	agtcctacaa	tcttcacat	180
atatttaggt	ttttaggcca	gccagctctt	tttttccaaa	gctttctttt	gaataccgc	240
ccgggcggcc	cctaaggcg	aattctgcag	atatccatca	cactggcggc	cgctcgagca	300
tgcatttaga	gggccaatt	cgccctatag	tgagtcgtat	tacaattcac	tgcccgctgt	360

<210> 400

<211> 87

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(87)

<223> n = A,T,C or G

<400> 400

ctgcacatat	cnattacact	ggcgcccgct	cgagcatgca	tgnagagggc	ccaattctcc	60
ctatattgag	tggaattaca	atncnct				87

<210> 401

<211> 328

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(328)

<223> n = A,T,C or G

<400> 401

accagaggac	acaaacactc	tgcttaggaa	aaccagagac	ctttgttcac	ttgtttatct	60
gctgaccttc	cttcactat	tgtcctatga	ccttgccaaa	tccccctctg	cgagaaacac	120
ccaagaatga	tcaataaaaa	ataaaataaa	attaaattaa	aaaaaaaaaa	agagaggaac	180
ccacaaaaaa	aaaaaaaaag	aaagtntata	aaataaaata	ttgaagtcct	ttcccattaa	240
aaaaaaaaaa	aagaaaaagc	acggactctt	tcatccagtt	ctgatgtgat	tatctctgga	300
aggcatcttc	tcctcctctt	ccctcccc				328

<210> 402
 <211> 268
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(268)
 <223> n = A,T,C or G

<400> 402
 nacataatga caacatcttc actagactga gtgttcaagg atttgagatg attcgctatt 60
 catcacaccc cgaagattga gatccactgt atttacacaa agcaaagcca tgtcagcaag 120
 ggactgtcaa cctgattctg agaacataaa cattcaaaat ttattttcca gtgttccttt 180
 ttggaaacca acaacacatc tttaatacct acacacacac acatctntac ctttaaaaaa 240
 aaaaaaaaaa tgnaacttca cagatagt 268

<210> 403
 <211> 538
 <212> DNA
 <213> Homo sapien

<400> 403
 acagtgatag ctccccctgg gcaatacaat acaagaacag tgggttttgt caaatgggaa 60
 caaggaaaca gaaccacaga aataaataca ttggttaaca tcagattagt tcaggttact 120
 tttttgtaaa agttaaagta gaggggactt ctgtattatg ctaactcaag tagactggaa 180
 tctcctgtgt tctttttttt tttaaattgg tttaattttt tttaattgg atctatcttc 240
 ttctttaaca ttccagttgg agtatgtacg atttagcacc actggctcaa tgcgctcacc 300
 taggtgagag tgtgaccaa tcttaaagca ttagtgctat tatcagttac caccatttgg 360
 ggctttttatc cttcatgggt tatgatgttc tctgatgac acatttctct gagttttgta 420
 attccagcca aagagagacc attcactatt tgatggctgg ctgcatgcag acatttaaaag 480
 cttttagaga atacactaca ccaggggagta tgactactag tatgactatt aggaggggt 538

<210> 404
 <211> 310
 <212> DNA
 <213> Homo sapien

<400> 404
 tttttttata gatacaattg gcttttattt gtgattcatg agtcagggca gtttccattc 60
 tgcaaaatat agtgatagct cctactgggc aatacaacag tagaacagtg ggttttgtaa 120
 aatgggaatc caggaacaga agaataataa taaattgatt taaataaact gattgggttaa 180
 ttccagaata cttcatatta cttttttcta agagttaaag cagaaaggac tttcttactg 240
 tgctgactca gacagcctgg actctcatgt ttttaggaaa attttgtctg ttctgggatac 300
 tacctgcttc 310

<210> 405
 <211> 559
 <212> DNA
 <213> Homo sapien

<400> 405
 acaaatcaca attattaact cactggtagg gcagtgatga tcaaaccaat tgcattcatc 60
 catgctgtaa tgttctctct tggcactaaa ggctgactgc agccggcaaa aaagaatgta 120

```

agtatgaatt tataaaaaaca ttttagatgg ctgacaacgg atcttatttt taaagaatat 180
gtctaattca gaggatcgac aactaatcca tttcaataaa acaatgggga attttttatt 240
gaataaaaaat gtaatatgca taaaaactca agaaggcttt ttaaaaatac ttcttcccca 300
atcattatcc catacttcat gctaattttt aaaagaatct tgaaatcttg aaaacaagat 360
gaagagaatc ttgttttaag tgacaagtta acattattcc tatattaaat gtcaaactgc 420
tattaatgag tagaagtagg acaaaacccg gatcttagga tcctgtccag ggctcattcc 480
ataactccta tatcacaag acaagatctg gaaccagaaa acagtcatca tccaatgtgc 540
atcagccttg cggcaacag 559

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<210> 406

<211> 427

<212> DNA

<213> Homo sapien

<400> 406

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acaacagaat atctcgggaa tggactcaga agtatgccat gtgatgctac cttaaagtca 60
gaataacctg cattatagct ggaataaact ttaaattact gttccttttt tgattttctt 120
atccggctgc tcccctatca gacctcatct tttttaattt tattttttgt ttacctccct 180
ccattcattc acatgctcat ctgagaagac ttaagttctt ccagcttttg acaataactg 240
cttttagaaa ctgtaaagta gttacaagag aacagttgcc caagactcag aatttttaa 300
aaaaaaaaat gagcatgtgt attatgtggc caatgtcttc actctaactt ggttatgaga 360
ctaaaacat tctcactgc tctaacatgc tgaagaaatc atctgagggg gagggagatg 420
gatgctc 427

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<210> 407

<211> 419

<212> DNA

<213> Homo sapien

<400> 407

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acaatttgta gttgtttcca ggtttggtta ataatcattc cttaacctag aattcagatg 60
atcttggaat taaggcaggt cagaggactg taatgataga attaaattag tgtcactaaa 120
aactgtccca aagtgtctgt tcctaatagg aattcattaa cctaaaacaa gatgttacta 180
ttatatcgat agactatgaa tgctatttct agaaaaagtc tagtgccaaa tttgtcttat 240
taaataaaaa caatgtagga gcagcttttc ttctagtttg atgtcattta agaattacta 300
acacagtggc agtggttaaat gaagatgctg tctacaaggt agataatata ctgtttgata 360
ctcaaaacat ttttcatttt gtttaaagta gaagttacat aattctatat ttttaagtct 419

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<210> 408

<211> 523

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(523)

<223> n = A,T,C or G

<400> 408

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acatttgatg ttatgtgaat gttgagtttt tttcttctaa ttttcacttc agcagtgttt 60
agggttttca gatgccttat tccagtgtga acagaaaaag ttcatttttt atgtgggttaa 120
tgctttgatg tgtcacataa agagtgtttt gtagaaaatg ttggcacaat ttttaacttct 180
tagtggcttg tgacattata tattatata atatgtatat atatctttat aacattcctg 240
tgtttagtag tgtaaatgtt ctgggcaagt ttttaatttt tgaatgcctt tggatattcc 300
agcaataaag gcatcatggt ctgcaatagg atttcttact catttaccta ttttaacact 360

```

aaaatagacc acaactgagc acaaattcct tttataaatg ttatagaagc agggaagaat 420
 aataaacaca tttgtgaatt gtggttcagt ttatttatct ttagggaagg ctgatcattt 480
 atcttatagc acataacccc agcctcttat tcattatggn taa 523

<210> 409

<211> 191

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(191)

<223> n = A,T,C or G

<400> 409

accccgtagt gatgagcact gactgggtca ctggccacat ttagttctt cataataata 60
 ggccacaaaa gggctctgtg gtttgccctc atgtgcaactg gccctcccc acccctaggg 120
 ggcaactcagt agctgctgag aaggcctgtc cacgangctg ttggaacccc tcaataaat 180
 acttagaagn a 191

<210> 410

<211> 403

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(403)

<223> n = A,T,C or G

<400> 410

acactggcca gtgtgttttt ggcgattaaa cataatcctg tgaatcagat taattcactt 60
 gctgagtgtt catttgccgc atccctctgt tgggtcttgg gggccctcca cgacctcgtg 120
 gggctccccg tggteccactc tgcccagagc ctgcttgaa attctgctga tatccatccc 180
 gttgatagcc agagtaatcc cggggagcac tgaactgaga ctgtgtataa ccactgtttg 240
 gagtgttaga gaatgaaggg cggtaacat catatcctcc tctgaatcca ttggcagggc 300
 cccggtatcc atccatcaag cctctagcac cacgggagcc tccacgagac acaccacgac 360
 tattgtaata gggctgattg ctacgtggaa atccagtnt ctg 403

<210> 411

<211> 384

<212> DNA

<213> Homo sapien

<400> 411

acgtgaaatc ataacaacat gttctcttgt gtttggttc tcttgctcag catgatattt 60
 ttacggttca cccatattgc atgtatcagg aatataatcc tttttattat tgagttagtg 120
 tctattgtat gtatatacca cagtttattt ctcccttcac cctttgctag attttggggt 180
 tttttcacat tgcgctattc aagtataaac ctgctctcaa cattcatgtg caagtctttg 240
 agtggacata tatttgccgt ttctcttgag tgaatgcacc ttgttggtc acgtggctta 300
 atttaaaaaa attttaatca ctgtggtgca tatgtagtga ttattagtga ttatctcata 360
 attttatttt cttgatgact aatg 384

<210> 412

<211> 315

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(315)

<223> n = A,T,C or G

<400> 412

acaatatttc	tcctttgaga	agataggata	tatgattttc	ccaaaaatca	caactttgaa	60
ggaagactta	nttgetgact	tcaattatat	cctggaactg	gcaacttggt	cccttccttt	120
gcttcaaaaa	aagtgtgaaga	aagagtata	agatcaactt	taatcattct	tggatcttca	180
gcaaatccag	gatcaatgta	gaaaaacact	ggcatatcta	cttcctcttg	gggattaagc	240
ctttgttctt	caaaacagaa	gcactgtatt	ttattgaaat	actgtccacc	ttcaaatgga	300
acaatattgt	atgna					315

<210> 413

<211> 554

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(554)

<223> n = A,T,C or G

<400> 413

acaggtttca	ctattacaaa	tatatgatgt	taaactaaca	aactcatgac	cttcaaagat	60
gtcttcgtcc	cacgcacaca	catttgtaat	ttgtgtccat	ttgtattttc	ccttcttcta	120
taatcttcaa	attatatagt	tatgcattga	gttccttatg	catctcacc	atctccttta	180
tctcagcctt	ctcatacttt	gccattctct	tctttctgga	aataaccagc	acaacaattc	240
cagcaacaac	tgctatcacc	acaaccacaa	taacagcaat	aacaccagct	tttagaccct	300
gcattgagaa	ttcaggtgct	ttttcatcaa	cataataaat	ttaaagtttg	ccaggatcca	360
gatccagttg	ttccccattt	actgtcaggt	gccattttct	tagaatgaaa	caaggattca	420
cctttaacat	ctttttcaaa	ataataagcc	acatcagcta	tgtccacatc	attctgagnt	480
ttttgagaag	aattttgaac	cagatcaata	gtgataacat	tattctcata	caaaatactc	540
ngataaatt	ntgg					554

<210> 414

<211> 267

<212> DNA

<213> Homo sapien

<400> 414

accagaaagg	cacacgattt	tacaatattt	gttggaaatta	ccttactttt	taacctcttc	60
atagcagttt	tggtttgagt	atattgatga	aagccaaagt	ctggatatcta	aaacttgggc	120
caatgtttcc	caactggtat	atgtcaggct	ttcccaatag	cttaactgtg	accctatacg	180
gatggctttt	tagatagttc	tatactgctg	tattgtgtta	gcacttttct	ttgtcattaa	240
caacacactt	taaatgacat	ttggtga				267

<210> 415

<211> 454

<212> DNA

<213> Homo sapien

<400> 415

accggaacct	gcagaaacag	tgtgagaaat	taagtcctgg	ttcactgcgc	agtagcaaag	60
atgggtcaagg	ccatggaaaa	agcagaaatt	taccaagaaa	gctgataccc	atgtatagtt	120
cccactcatc	tcaaatacat	ctgctatctt	tttaagctaa	gtcctagaca	tatcggggat	180
aacatggggg	ttgattagtg	accacagtta	tcagaagcag	agaaatgtaa	ttccatattt	240
tatttgaaac	ttattccata	ttttaattgg	atattgagtg	attgggttat	caaacaccca	300
caaactttta	ttttgtttaa	tttatatggc	tttgaaatag	aagtataagt	tgctaccatt	360
ttttgataac	attgaaagat	agtattttac	catctttaat	catcttggaa	aatacaagtc	420
ctgtgaacaa	ccactctttc	acctagcagt	atga			454

<210> 416

<211> 370

<212> DNA

<213> Homo sapien

<400> 416

ccgacacggg	gccagcgccc	tgctgcgtgc	ccgccagcta	caatcccatg	gtgctcatte	60
aaaagaccga	taccgggggtg	tcgctccaga	cctatgatga	cttggttagcc	aaagactgcc	120
actgcatatg	agcagtcctg	gtccttccac	tggtgcacctg	cgcggaggac	gcgacctcag	180
ttgtcctgcc	ctgtggaatg	ggctcaaggt	tcctgagaca	cccgatctct	gcccacacag	240
ctgtatttat	ataagtctgt	tatttattat	taattttattg	gggtgacctt	cttggggact	300
cgggggctgg	tctgatggaa	ctgtgtattt	atttaaaact	ctggtgataa	aaataaagct	360
gtctgaactg						370

<210> 417

<211> 463

<212> DNA

<213> Homo sapien

<400> 417

acactttata	tattccaaat	tgatcagata	tatggtttgc	aaattcatct	caatctgtag	60
cttatctttt	cctcttctta	aatcacaagt	ttttaaat	tgaagaagtc	caatatatca	120
gattttgtct	tttatggatg	tgctttcggg	gcaaagtcca	agaacttgtc	acctagccca	180
agatcctgaa	gattttttct	ctgtggcttt	tttcaaagtt	atctagtttt	atgtatcaca	240
tttaagtccg	ttatacat	tgagttaaat	tttatataag	acgtgaggtt	taagtagagg	300
ttcttttttc	tcctcgccat	gggtgtctaa	ttgctctagc	ataatttgtc	agaaaggcta	360
ttcttctctc	attgaattgc	tttttcactt	tttcaaaatc	agctgagcat	atttatatgg	420
gtttatttct	gggttctctc	atctgttcca	ttgacgtatg	tgt		463

<210> 418

<211> 334

<212> DNA

<213> Homo sapien

<400> 418

ttagcatttg	cttttatttt	tttactttga	tgctttttca	aattggcatg	tctttaaagt	60
atttttcttc	ctgattaaaa	atgtgtgtgt	atgtgtgtgt	gtgtgtgtat	atatatat	120
ttttaaatca	cattaatttt	accaagtga	accaagccat	actgtttttg	agccaattaa	180
gaaaattgcc	attttttaaag	tgtagcattt	cagggtaaag	acccatgaaa	tggtttgatg	240
tattctagac	tactgaaaga	aaaccacttc	aaagattttg	ttgaaagttt	tagtgtttgc	300
tgaaatgcaa	gaggggaagg	gattggtagt	gagt			334

<210> 419

<211> 297

<212> DNA

<213> Homo sapien

<400> 419

acttctttga	ccaaggaata	ccacagacac	cctaccgata	gaacagtggc	tcagatctta	60
cttgctcctg	cttacgaagt	attcccaatc	actggctatc	tgaccctact	tgaacactcc	120
tgaacagtca	tgttttttaa	aatcttcctt	tatatcaagt	cagagagtat	acttctataa	180
atttcactca	tggatgttag	gaaatctagt	catcttcctt	gtgattgcc	tgtaagtat	240
ttaaccatag	ctatcatgtg	tttcccaaat	cttctctaga	ttaaatact	tcagtta	297

<210> 420

<211> 418

<212> DNA

<213> Homo sapien

<400> 420

acgagaggaa	ccgcagggtc	agacatttgg	tgtatgtcct	atcaatagga	gctgtatttg	60
ccatcatagg	aggcttcatt	cactgatttc	ccctattctc	aggctacacc	ctagaccaaa	120
cctacgccaa	aatccatttc	gctatcatat	tcctcggcgt	aaatctaact	ttcttccac	180
aacactttct	cggcctatcc	ggaatgcccc	gacgttactc	ggactacccc	gatacataca	240
ccacatgaaa	tatcctatca	tctgtaggct	cattcatctc	tctaacagca	gtaatattaa	300
taattttcat	gatttgagaa	gccttcgctt	cgaagcgaaa	agtcctaata	gtagaagaac	360
cctccataaa	cctggagtga	ctatatggat	gccccccacc	ctaccacaca	ttcgaaga	418

<210> 421

<211> 304

<212> DNA

<213> Homo sapien

<400> 421

acgcctggac	ccctgtgact	tgcagcctat	ctttgatgac	atgctccact	ttctaaatcc	60
tgaggagctg	cgggtgattg	aagagattcc	ccaggctgag	gacaaaactag	accggctatt	120
cgaatattat	ggagtcaaga	gccaggaagc	cagccagacc	ctcctggact	ctgtttatag	180
ccatcttcct	gacctgctgt	agaacatagg	gatactgcat	tctggaaatt	actcaattta	240
gtggcagggt	ggttttttaa	ttttctctct	ttctgattt	ttgttgtttg	gggtgtgtgt	300
gtgt						304

<210> 422

<211> 578

<212> DNA

<213> Homo sapien

<400> 422

actgtgcagg	cagattcaca	gggtggtggt	aaagcatcca	caatggctct	ggcagcatca	60
ggatcacact	tgaaggggct	ctcagacaaa	gttgatttca	tgcaactgat	tccttttcca	120
ttcgttttct	tagtactaa	tgctttccaa	tggtcatgag	tgcttttaat	aatatcaatg	180
gcaaagtcc	tatctttaaa	ttctgcatta	aacgcaaact	cattttctgg	ttttccatca	240
ggaaccttat	accttctaaa	ccagtccaca	gtagcttcta	agtagccagg	tttcagccgt	300
ttgacatcat	tgatatcatt	ataattggct	gcatcaggat	catccacatt	aatggcaatg	360
actttccagt	cggtttcccc	ttcgtcaatc	atagccaata	tgcttagaac	tttcaattat	420
ttatttcacc	tcttgacat	accttgcttc	caatttcaca	cacatcaatt	gggtcattgt	480
caccacaaca	gccagtatgt	ttatcattgt	gcctgggtc	ttcccaagtc	tgagggatgg	540
caccatagtt	ccagatatat	cctttatagc	ggaacaaa			578

<210> 423

<211> 327

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(327)

<223> n = A,T,C or G

<400> 423

acagtatatt tttagaaact catttttcta ctaaaacaaa cacagtttac tttagagaga	60
ctgcaataga atcaaaattt gaaactgaaa tctttgttta aaagggttaa gttgaggcaa	120
gaggaaagcc ctttctctct cttataaaaa ggcacaacct cattggggag ctaagctagg	180
tcattgtcat ggtgaagaag agaagcatcg tttttatatt taggaaattt taaaagatga	240
tggaaagcac atttagcttg gtctgaggca ggttctgttg gggcagtgtt aatggaaagg	300
gctcactgnt gntactacta gaaaaat	327

<210> 424

<211> 384

<212> DNA

<213> Homo sapien

<400> 424

acgaaaaata aatctcctta aaaactaaat aaaatgcact gtattcttac agttaatggt	60
tataactata gtaaaaaatt aatatatata ctattacata aatgttatrt cttaggtggt	120
ccattaagaa gagcaataga ataatgctaa aaaataatgc ctataaatct tcagagata	180
aagacatcca ttcagaaaca aaaattagca ctaaaatttt tataaaatag accagatgac	240
aaaattttatt ttatttttaa acagtgggtt tgacacaaat tatgttattg aaaagcatta	300
ttaatgttta atttatttaa aattttggaa tttgccattt ctacagagaat gatcaggcct	360
taggaaatta atacagtagt agta	384

<210> 425

<211> 255

<212> DNA

<213> Homo sapien

<400> 425

actatcaggc tttgtgctga tttcctgaac aaactgcatt atattatgaa aacaaaagga	60
aaagaagaaa taataaaaac tatactccca tatttcactt acagtgtttg agttcctgga	120
aggacctata taatggaggc agcattcaaa caagaaatta tgccaatcaa ctgtcaaatt	180
ttcactataa ttttcctaaa aaggcggttt tcccccaata tctattaatc tcaaagaaac	240
ataagttgtg aatgt	255

<210> 426

<211> 196

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(196)

<223> n = A,T,C or G

<400> 426

acatgaantn nccaggccca cacagccaga cagcaacaga accaagacct agggctcttc	60
actcctgtta catcacacca tggcaatgat ttacattct ccaactgatt caaatcatat	120

ggcagctagg gatttggggg ctccatgttt tatttcaatt gcaagttcaa gatttctttt 180
tattctttgtg ggctga 196

<210> 427
<211> 163
<212> DNA
<213> Homo sapien

<400> 427
acagaagatc catggaggca agtgctgtca ggaaggacac tgctccctc caccctcca 60
aatgtcacca ccaagttcct tcaggtgaga cctcacacaa tgtcaagtc tttctaggaa 120
atactaagat caggttgaga gattctgctt ggtctagtca atc 163

<210> 428
<211> 315
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(315)
<223> n = A,T,C or G

<400> 428
nactgagtan agatgctggg gaatgtgcaa tatgccttga agaattgcag cagggagata 60
ctatagcacg actgccttgt ctatgcatat atcataaagg ctgcatagat gaatggtttg 120
aagtaaatag atcttgccct gagcaccctt cagattaagc gtcagcttcc tgttttatag 180
gttttcttgt cttgacaaga tgcttgaaaa accaagagga tatgaaaatc tgtctctgga 240
gaaacaaaga cgcaggcata ctgagccaga aatctgagtt ttgtgagact tggaataca 300
gagatggaca atcgt 315

<210> 429
<211> 131
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(131)
<223> n = A,T,C or G

<400> 429
acagttaggn actagaacat ttgttaagcc tcccaaagta gngtgcattg aagattctag 60
agtgtccagc tcttgacta caaatgtaat aataacagaa taaatacact taccctgatg 120
atattgaggg t 131

<210> 430
<211> 503
<212> DNA
<213> Homo sapien

<400> 430
actgattttt aataaaagaa ataaggttca aagtttagca caacaacaca gcaataagaa 60
gctgacaact tggataaaaa tacaagaaag taacacagag ccagggtac ccattattta 120
ctgtgtgcat acaggaatgc tatacttcag atgtataaat tagagactga ttttaagtta 180

ttaatttaac	tactttttgt	ccactgtgct	aaactaaatt	ttatacta	gtgctactgc	240
gtaaacactt	caaagcaatc	ttcattaaaa	tgctgcaaag	aaaaacaaga	atacacatca	300
tccaaaacta	aggatgtcat	tgcagttcac	agtttgtata	ataaatatcc	tccctttcaa	360
tcactactaa	gatcactaca	tccatcttac	tcacagcac	aaccttgaag	caacttatac	420
ttacaaatat	tagcaatgca	gccaaacatt	tgttttttgc	aaagcaacta	gtaaaaatca	480
agaattttta	ttaagacggt	gca				503

<210> 431

<211> 207

<212> DNA

<213> Homo sapien

<400> 431

acaagtgtgg	cctcatcaag	ccctgcccag	ccaactactt	tgcgttttaa	atctgcagtg	60
gggccgccaa	cgctgtgggc	cctactatgt	gctttgaaga	ccgcatgac	atgagtcctg	120
tgaaaaacaa	tgtgggcaga	ggcctaaaca	tcgcccgtgt	gaatggaacc	acgggagctg	180
tgctgggaca	gaaggcattt	gacatgt				207

<210> 432

<211> 485

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(485)

<223> n = A,T,C or G

<400> 432

aaaaaaagta	atggaaaaat	ggttgcaggt	ttaatcncaa	aangaactta	attttngtng	60
attttgtttt	atctgctaaa	acactaatat	ctataaatat	gaactgacag	catcgttcta	120
aatttacttc	tgaagagctg	tcgagacttc	aataaaatat	aagcaagtta	ctggatcata	180
tttatggact	gctgaattaa	ctacccgaaa	agtatcagtt	actttcaaag	aacacaaaac	240
aaagtgaacg	tggaaaaaag	ccttctttgc	aaaagtcctt	ttattagtcc	tatcctctaa	300
aattccaagc	cacagagcct	tgatattcct	ggattctgtt	ttaagtaacc	ttagttttta	360
atatgacact	tgggatatgc	acaatgggaa	agggtaggat	atgtgaacaa	aatttaattt	420
ctttttttcca	aaggnagnca	ttttctttta	atncatccta	tccacttttg	cccacttccc	480
catgt						485

<210> 433

<211> 280

<212> DNA

<213> Homo sapien

<400> 433

actgtcacta	caatattaca	ttctgcaaat	gttattctgt	tgtatcagat	acaaaatttt	60
agtggaggtat	ctctaaggca	catagtagaa	aacaaaattg	gttaattact	caagttcctt	120
tcactgtgat	ttggaaatga	tttaatcttt	atagaatgag	aacctttttt	ggactagctt	180
ttttattaaa	atggctcaat	ttgtgttgat	aaggattgca	ttaatattta	atagtgtctg	240
cttttcctct	gggcacacca	ttttgatcat	taaccagagt			280

<210> 434

<211> 234

<212> DNA

<213> Homo sapien

<400> 434

ctttgctgcg	catcaggtgc	tttaagcttc	ggaacaactg	tgcaggattc	tatttttagta	60
ttctggaagc	atcattgagg	aagtagtcca	gtgaagttag	ctctaaaaaa	actctttact	120
ctaacaatta	aaagaaatat	gccaaaggat	ccataaggga	tgaataaatt	attaaactat	180
taagaagttg	ctataaatat	gcagtgttaa	ttcaataatt	cataacggac	tggt	234

<210> 435

<211> 330

<212> DNA

<213> Homo sapien

<400> 435

acctcccgtg	tcaccagttc	ccacagaagc	actgcaaaac	tccacatgtc	tgctgagcgt	60
ctgttttgtg	cttcaggctt	cttctgcaga	gcttcggggg	ctaccaggc	aggtgcatac	120
atgcgaccag	gacattggaa	agagaacttg	acatcagcca	tgctaattcg	ggcagtcatg	180
tcctcatcaa	tcattacact	acggctattg	agtgcattgc	gtgggatgag	gggctctagt	240
gtgtgttaga	aagccatgcc	ccttgccatg	tccaaagcaa	acttcacagc	ctggctctgg	300
tccacgacga	aattggtgcc	ttcatgtagt				330

<210> 436

<211> 311

<212> DNA

<213> Homo sapien

<400> 436

acaactttac	aatggaattg	tattttcaatg	attattttga	tatcagatta	aaccttccaa	60
aaagttacac	ataattcagg	tctatttttt	ctaccagtaa	gagttctgct	aaattacaaa	120
accccataat	cacagtgttc	agttttttaa	aaattaaaca	cacagtaatc	ctgtcaatgt	180
taattcaaat	caaaacttcg	gaatgccgtg	gcatttatgt	gaccaatctg	agtttttagat	240
acaaatacca	gctgtttatc	ccatgaacca	tttttcctag	gctgaggctg	tgaaaaatcg	300
aaagtcggcg	t					311

<210> 437

<211> 355

<212> DNA

<213> Homo sapien

<400> 437

actagtggat	gggggtcagg	gtgtcactcc	aaggccctct	acagacccag	agaagaggaa	60
agtcaaaaaa	gccagatatg	agactgctga	agtgggtgta	agaaatatag	gcaaggtaaa	120
gggaacaaga	tctgggctcc	ctcctacttg	tgccctcac	tggaacctcag	acaccctacc	180
tctaagactg	gttcttagaa	ggctgaacag	taaggagcat	tccaatagct	tctgaaactc	240
ccaaggctgt	ttcaagtagt	cgaaagccat	cctggactg	ttcaggtgcc	ttttctatct	300
cccacctgag	ctctctgccc	tttcttttag	cctcacaggt	ttccagaatt	acagt	355

<210> 438

<211> 431

<212> DNA

<213> Homo sapien

<400> 438

acagtaactt	taactttaca	tagagctgag	ataaaaaataa	agctttctta	caaattacat	60
tttttttcca	gtgaattact	tttgagtaa	aaatagctgc	tacataaatc	cctcctgac	120
tctgaaaagg	agttgcatat	ttccaaaaat	aatattctta	ttttaatcac	acagaagaac	180

gtggagcaca ggaaggaaat ggctgggtgg tcagagagag gtgagctgtc ggagaaacac	240
agttaaaacta aaaaataaaa tccattttgt gtataaaactg acttaaacgc atgcaaagaa	300
gtggaaaaca tatgccattt gtcaagaaaa atactgcttt atagctttta ctttacaatt	360
aaaggagaaa gcagaggcca gatataagcc cagataataa catttaagtt tctcataaaa	420
ctcccaaatg t	431

<210> 439

<211> 170

<212> DNA

<213> Homo sapien

<400> 439

actgtcataa aaaacagtgg agctctgtat tagaaagccc ctcagaactg ggaaggccag	60
gtaactctag ttacacagaa actgtgacta aagtctatga aactgattac aacagactgt	120
aagaatcaaa gtcaactgac atctatgcta catattatta tatagtttgt	170

<210> 440

<211> 400

<212> DNA

<213> Homo sapien

<400> 440

acgtaaaaag aacatccttc ccatcttcaa ggtcaagatt gaacgctgac tcctgcagga	60
agtcttccag gattcccagg caggaatgat ggctccctgt ccctgtagct ccaggagtc	120
ttgcttcacg caccgctcac ataccagact gaatggtggc aggaggagtg accaggctcg	180
tcctctgtgt ccctaccacc tacaacaggc cagcaatcta ccctgtgtgtg tttgttgga	240
agaattaacc atgatgggcg gccgagggcg cctggagcta tttgggggct tggagagAAC	300
ctcttaggag agtgtcaggc tctaggccag tgtcaccaga ggaggtcagt ctcagtcctt	360
ggagtggtgg gatggaaacc agacgggact ggcctggtcc	400

<210> 441

<211> 204

<212> DNA

<213> Homo sapien

<400> 441

acctagttag ttcttaagat caggtgtata aaactgtgga gtggagcggg atggtatgga	60
atgacttgga atgtaagctg tcagggagaa aatggtgtta cacttttgct aagatctggg	120
ggtttcttca tattctctgt gttggaagca gttgaccaga aatgcttgcc agtactgcca	180
aagcactgct gtgaaatgtg aagt	204

<210> 442

<211> 649

<212> DNA

<213> Homo sapien

<400> 442

acatttaatt ttttacaaca ttttctccct agagatataa tttagatatt cctatcttca	60
aagtaaaaat caaaatagga aataagcata gaaacagcct attggcagtg gttacacctg	120
catgggtatt atgagtctcc aaactatttg aaatttatt caaccaagggt tctcttaagt	180
cttcattact tgggtgtaac tcgagagaaa actaatttat atcaatttac agtttagtgg	240
tcatgatcag gggaaagtga tactcttcca ctgactacaa gtcattgcag aggcagttta	300
gaacttttcc tttattccta atatacagga caaaccttgc cgacatctca ctacctcaaa	360
aatcaaattt aaatgaagta tccaggagta gcctaaagaa tgagtgtaat ctggatggat	420
tttagtctaa atttatgcct tgctcttcag taaagtatat taactccaga tatatgttcc	480

acagatgcaa taatttctgt tccttggtcg gtgcagaata taatttatac ttccctgaaat	540
caactttgtc tattcatgaa aatagctgct ttttatttgc ctttgtctca ctttgaatat	600
atatgatcca caggttacag acttttccaa taactacatt tcaacttgt	649

<210> 443
 <211> 346
 <212> DNA
 <213> Homo sapien

<400> 443	
acgtgggatt gaaatgcaca tacatgtttt tgctaagagc acatacattt cattctcctc	60
actttgttca taacctcagc attgtcagat aacctcagtg agttaactca aagcctttta	120
ttatggaaag aactggcaca gttacatttg ccagtggcaa catccttaaa aattaataac	180
tgatgggtca cggacagatt ttgacctag ttcttttttc ttttagagca aaaagaactt	240
ttacctggc atccagccca acccctaaag actgacaata tccttcaagc tcctttgaaa	300
gcaccctaaa cagccatttc cattttaata gttggatgcg gattgt	346

<210> 444
 <211> 425
 <212> DNA
 <213> Homo sapien

<400> 444	
accaatttcc tttacagta aaggggcttt tcctgttgc tgttgaaccg gttcccagct	60
gccattacc accaagccca aaagagtaaa ttctcctga tgaaggaca aaagcagaag	120
tgtgctgccg tccacaagca atctcagtga caatgcttc cataagttca aaaactttcc	180
ttgggtttat ttcatgactg gtagaattat ggcccaactg accataccct ccagctccaa	240
aagtaaacac tccaccttc ttgggttagag cagcagtag atcttctcca caacaaatat	300
aaactatttt ctgagatctt agtgacttta gtaaattagg aacataccta tcattttcat	360
cattaagacc tagctgacca aacttggtgc gtcccatcc aaagatagct ccagaaagg	420
tgagt	425

<210> 445
 <211> 210
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(210)
 <223> n = A,T,C or G

<400> 445	
nactgtccca atataaaaca gtaattattt gacctttgca ctgtttgtct ggctcttttc	60
agtttgattg catataaatg tggaacttga tagatctcta tatttttaat gcacttgatga	120
taaactggca gcagggttag acattacttt caaagcttga ggtagaccga gtcagcatgc	180
tagacaggct tctctctcta accaaaactg	210

<210> 446
 <211> 326
 <212> DNA
 <213> Homo sapien

<400> 446	
tcgaaagacc cctgtaaaag agcccaacag tgaaaatgta gatatcagca gtggaggagg	60

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cgtgacaggc tgaagagca aatgctgctg agcattctcc tgttccatca gttgccatcc 120
actaccccggt tttctcttct tgetgcaaaa taaaccactc tgcccatttt taactctaaa 180
cagatatttt tgtttctcat cttactatc caagccacct attttatttg ttctttcatc 240
tgtgactgct tgetgacttt atcataatct tcttcaaaaa aaaaaatgta tagaaaaatc 300
atgtctgtga gttcattttt aaatgt 326

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<210> 447
<211> 304
<212> DNA
<213> Homo sapien

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<220>
<221> misc_feature
<222> (1)...(304)
<223> n = A,T,C or G

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<400> 447
ncntcnaggt acatgctaga agtctgatgt ngtnngtaac acagaaacat acacagtctt 60
catattcaaa gtcttcacng ggatgtcggt ctgtaatttc ctgcgtttgg gtctcttcca 120
gaaacagctt tagcttctcg ctccgaaggc caaacacctt ggctgcttca tacagaagac 180
cttgggtgggt gagtccattc tgcccagggt gggtttcaag caggagagtg cccactgtcc 240
ccattaaaaa ctcttggtgc tttgcattca ggagctgtag gttgatatac tgacaaggaa 300
gagt 304

```

```

<210> 448
<211> 203
<212> DNA
<213> Homo sapien

```

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<400> 448
acatgaaagc ggcaatgcgg taaaaagcga attcttacct aagggtcagaa ttttttatta 60
agcgcatttt cattagttgg acaacaacc ttataaacc ttatgtcaaa ccatataatg 120
tgaagaatct ccatgggaga gatttttttt cacccttcag aattatcttt ttcccctaag 180
accttcatat gaatcttctt tgt 203

```

```

<210> 449
<211> 481
<212> DNA
<213> Homo sapien

```

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<220>
<221> misc_feature
<222> (1)...(481)
<223> n = A,T,C or G

```

```

<400> 449
acttggttcta taatactctg atgtttcctt aaattcctga acaacattct gtttactaaa 60
tttcttttct tcctttattc acaccaaatt ccaccctata atagaagcta attatttcag 120
aaagcttttt agtgatcatt tattactttg tgtttactag atattaattc taagatgaat 180
tccttttagaa ttttagaaaa aattattcta gacaacaatc aaagtaaagg atacatccag 240
cattgaaacc ataagccggc aagtctccag gttaaaagggt ttgtatcctc cagcaatgcc 300
agactgtgtc agacatctct gcaattcatc agcatctatc tgcccactct gtccagctac 360
agcagcaaaag taaccatata gcggatcctg agtttgcctg ggaaacgcag gccctccggg 420
agccccctcca tactgcactc tgagttgaag tcttatangt agaagctggt gatccttaga 480
g 481

```

<210> 450
 <211> 296
 <212> DNA
 <213> Homo sapien

<400> 450
 acatggttta atacaacaac aaaaaaattt aatcaagtga aacgtaataa actgaacaat 60
 aaacactcaa aacattttcc attggaaaca tgtaaagaca atatgaggtt ttgttaccat 120
 cttactgcaa ttttcttatg tgttactagt ctacataccc catgttttct gtaatcatgc 180
 agatgtgaat ggaagtttga atgattaaat aaatgaaaag tccgtttact gcagggaatc 240
 atttcacaag gcagccaaac cgggtttaga gaacaaaact attcaagaaa ttctcc 296

<210> 451
 <211> 294
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(294)
 <223> n = A,T,C or G

<400> 451
 acatgntcca aggcacgcgn ctgtgaactt cctctgagtg aaggcatccc ctccagcacc 60
 tttcagcctg ctagtttaga cgaccgcgcg ccaccctcca ggacctccag ccttgcaactg 120
 cctttctctt cttttaaata attcttcatt gagttctaat atgtaaaaaa aaagtttact 180
 gtaaagtttg caaataanga aatttttttt aaaagtcctc agtaattctta ccagtaacaa 240
 ttgttatggg cacatttgct tttggaagat ttcttttgta tgcattggat aagt 294

<210> 452
 <211> 129
 <212> DNA
 <213> Homo sapien

<400> 452
 acttttagat cacaatttg cctttaagta acacataata cacttaaggc agatttgctt 60
 tacagggtgc ctcagcttct aaacaccact acactgcttt atataaaaaa caaaaatcac 120
 atagaagag 129

<210> 453
 <211> 151
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(151)
 <223> n = A,T,C or G

<400> 453
 actctcaann tgtatttagg tgccaacaca tttaggatca ttgnnnttc tcagtgaatt 60
 gaccttttta tgagaataaa atgtctatct ctgaaatgct cctatttctg gaaatgttcc 120
 ttatactaaa gtccaacttg tgtggattan t 151

<210> 454
 <211> 119
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(119)
 <223> n = A,T,C or G

<400> 454
 tgctgatgna gcatgctttt taaatccttt aaaaacactc accatataaa cttgcatttg 60
 agcttgtgtg ttcttttgtt aatgtgtaga gttctccttt ctcgaaattg ccagtgtgt 119

<210> 455
 <211> 515
 <212> DNA
 <213> Homo sapien

<400> 455
 accttataaa gttccttttc atccttctct gtcttcaact gacattcaag ttgttctctt 60
 tcatgttgtg ccttcttgag tttggccttt aaactgtcta attcggtttc tttttcaatt 120
 gctttatgtg ttactgacac aatatcttcc tcaagctgat gggctttgga tgtagcatca 180
 ctgaacctct tcttaaaactc ttcattttcc atttttaagc tttgtgttac ttcagtaaga 240
 cctttttgtt ctgcttgacg ttggtcacat ctttctttct catggttaag ttctctttcc 300
 atttcccaa cttgttctcg aagttgtgct gtttcttttt ccagaacggc aattaacttt 360
 aacagttctt cttttcttt catggttttc tcaattttca actcaagaag gcctgctttt 420
 gtggtcacca ctaacatgtc agaatttctc tcatcttcca tagtaagcag ctcttcaact 480
 ggagaagaag ctcgaaactg gaaaggtgta cctgc 515

<210> 456
 <211> 350
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(350)
 <223> n = A,T,C or G

<400> 456
 actccctcc ccaaatagaa acctcaaaga ctgatccatt tcccctaggg cctgggccag 60
 gagtagctca ctgctcactg ctgaggagaa aggcacaaga tataatgtca taagagcagg 120
 acagtggctc agcctacaga gttccctata ggggaaagaa ggcaggaaat aggcgcaggg 180
 tctggctctg tccctgcacc accctgagca gctagtcttg ggaagggatt acaggccctg 240
 ggccataggg tgctcgccat tctgctttcc tatcctgttt ctctccctgt gctgctccct 300
 ttttagccagn gctgagaaat gttcancacc tgaggcaaaa ctgccatagt 350

<210> 457
 <211> 293
 <212> DNA
 <213> Homo sapien

<400> 457
 gcagggccaa cagtcacagc agccctgacc agagcattcc tggagctcaa gctcctctac 60

aaagaggtgg	acagagaaga	cagcagagac	catgggaccc	ccctcagccc	ctccctgcag	120
attgcatgtc	ccctggaagg	aggtcctgct	cacagcctca	cttctaacct	tctggaaccc	180
accaccact	gccaaagctca	ctattgaatc	cacgccattc	aatgtcgcag	aggggaagga	240
ggttcttcta	ctcgcgccaca	acctgcccc	gaatcgtatt	ggttacagct	ggt	293

<210> 458

<211> 500

<212> DNA

<213> Homo sapien

<400> 458

actagactcc	agattaccct	ttcttaataa	atatctcagg	gtaaggaaag	aaagaaactg	60
tatagatata	tttaaaatag	agaatacttt	ccaagcaata	catgatgcct	ttcctaaaaag	120
actctaaaag	aaaaagattc	tgtaactctc	ttttagcacc	aaattattgt	ttatcttgct	180
ggatatttta	tatgaacagt	gttaatttag	atgcactaaa	gcaaaggtag	gcaaactaca	240
accatgagtc	aaacatggcc	acacccattc	atttgctatt	gtctaagctg	gttttgcaact	300
acaactgcag	agttgaatag	atgcagcaga	tcctttacag	aaaaagtttt	ctgacctcaa	360
ttctaaagta	attgtagtag	ggagctggag	gactttcttt	ccctttatgg	taattttttg	420
agctacaaaa	agagccttgc	agaaatgggt	gaagggatta	atctttttaa	aataaatgct	480
atatattagg	aaaataaaaa					500

<210> 459

<211> 394

<212> DNA

<213> Homo sapien

<400> 459

ggtgaaaaga	cttgattttt	tgaaaggatt	gtttatcaaa	cacaattcta	atctcttctc	60
ttatgtattt	ttgtgcaacta	ggcgcagttg	tgtagcagtt	gagtaatgct	ggttagctgt	120
taagggtggcg	tggtgcagtg	cagagtgcct	ggctgtttcc	tgttttctcc	cgattgctcc	180
tgtgtaaaga	tgcttgctcg	tgcaaaaaca	aatggctgtc	cagtttatta	aaatgcctga	240
caactgcact	tccagtcacc	cgggccttgc	atataaataa	cggagcatat	agtgagcaca	300
tctagctgat	gataaatata	cctttttttc	cctcttcccc	ctaaaaatgg	taaatctgat	360
catatctaca	tgatgaact	taacatggaa	aatg			394

<210> 460

<211> 279

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(279)

<223> n = A,T,C or G

<400> 460

actnccgatt	gaagccccc	ttcgtataat	aattacatca	caagacgtct	tgcaactcatg	60
agctgtcccc	acattaggct	taaaaacaga	tgcaattccc	ggacgtctaa	accaaaccac	120
tttcaccgct	acacgaccgg	gggtatacta	cggtaaatgc	tctgaaatct	gtggagcaaa	180
ccacagtttc	atgcccatcg	tcctagaatt	aattccccct	aaaatctttg	aaatagggcc	240
cgtatttacc	ctatagcacc	ccctctagag	caaaaaaaaa			279

<210> 461

<211> 278

<212> DNA

<213> Homo sapien

<400> 461

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tttggacact aggaaaaaaac cttgtagaga gagtaaaaaa ttttaacaccc atagtaggcc      60
taaaagcagc caccaattaa gaaagcggtc aagctcaaca cccactacct aaaaaatccc      120
aaacatataa ctgaactcct cacacccaat tggaccaatc tatcacccta tagaagaact      180
aatgttagta taaagtaaca tgaaaacatt ctctccgcga taagcctgcy tcagattaaa      240
acactggact gacaattaac agccaatatc tacaatca                                278

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<210> 462

<211> 556

<212> DNA

<213> Homo sapiens

<400> 462

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aacgtccaag ggggccacat cgatgatggg caggcgggag gtcttggtgg ttttgtattc      60
aatcactgtc ttgccccagg ctccggtgtg actcgtgcag ccatcgacag tgacgctgta      120
ggtgaagcgg ctggtgccct cggcgcggtat ctcgatctcg ttggagccct ggaggagcag      180
ggccttcttg aggttgccag tctgctgggc catgtagggc acgctgttct tgcagtggta      240
ggtgatgttc tgggaggcct cgggtggacat caggcgcagg aaggtcagct ggatggccac      300
atcggcaggg tcggagccct ggccgccata ctcgaaactgg aatccatcgg tcatgctctc      360
gccgaacccg acatgcctct tgccttggg gtcttctgtg atgtaccagt tcttctgggc      420
cacactgggc tgagtggggt acacgcaggc ctccaccagt tccatgttgc agaagacttt      480
gatggcatcc aggttgacgc cttggttggg gtcaatccag tactctccac tcttccagtc      540
agagtggcac atcttg                                556

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<210> 463

<211> 659

<212> DNA

<213> Homo sapiens

<400> 463

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cacactgtgc cttccagtt gctggcccg taaaaaggcc tgaacctcac cgaggatacc      60
tacaagcccc ggatttacac ctgcgccacc tggagtgcct ttgtgacaga cagttcctgg      120
agtgcacgga agtcacaact ggtctatcag tccagacggg ggcctttggt caaatattct      180
tctgattact tccaagcccc ctctgactac agatactacc cctaccagtc cttccagact      240
ccacaacacc ccagcttctt cttccaggac aagagggtgt cctggtcctt ggtctacctc      300
cccaccatcc agagctgctg gaactacggc ttctcctgct cctcggacga gctccctgtc      360
ctgggcctca ccaagtcttg cggctcagat cgcaccattg cctacgaaaa caaagccctg      420
atgctctgcy aagggtctct cgtggcagac gtcaccgatt tcgagggctg gaaggctgcy      480
attcccagtg ccctggacac caacagctcg aagagcacc cctccttccc ctgcccggca      540
gggcacttca acggcttccg cacggtcac cgcctcttct acctgaccaa ctccctcagg      600
gtggactaga cggcgtggcc caagggtggg gagaaccgga gaaccccagg acgccttca      659

```

<210> 464

<211> 695

<212> DNA

<213> Homo sapiens

<400> 464

```

accttcattt gaccccatca gcttcagggc cttctttaca tttccactgg cctgatccat      60
gtatgcaatg ctatttttgc agtgatatgt gatgttctgg gaagctcggc tggagagaag      120
tcgaagggaat gccagctgca catcaaggac atcttcagga agttcaggat tgccgtagct      180
aaactgaaaa ccaccatcca tggactctcc aaaccaaagc tgtttcttct cagcactaga      240
atctgtccac cagtgtttcc gtggaacatt caaaggattg gcacttatgc atgtttcccc      300

```

```

agtttccata ttacagaata ccttgatagc atccaatttg catccttggg tagggtcaac 360
ccagtattct ccactcttga gttcaggatg gcagaatttc aggtctctgc agtttctagc 420
ggggttttta cgagaacccat caggactaat gaggtcttct atttgtccat taacagactt 480
gagtgaagtc ataattctcat cgggtgttgat ttgaaatcc attggttcat ctccataata 540
cggggcaaaa ccgccagctt tttcacctcc aatcccagca atggcagcgg ctccaacacc 600
accacagcaa ggaccagggg caccaggagg tccaggaggg cctggttgcc ctgggtggcc 660
tggggagccc tcagatcctc tttcacctct gttac 695

```

<210> 465

<211> 73

<212> DNA

<213> Homo sapiens

<400> 465

```

caggtccaga gctcccaggt ttccagggtg cagtcctctc agtcccagag ctcccagggt 60
ttcggtttcc agt 73

```

<210> 466

<211> 507

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(507)

<223> n = A,T,C or G

<400> 466

```

agcactggca gaggnagcca aatatagtga tgtgcgccag agataagtat tctcctctcc 60
aagcatattg ctatacaaga ctttaaagac ttcataaaag ccaaacttgc agagtccctg 120
catggagtag ccaaggaaag tccgagccca tcccttagcc aaaccacgaa caccatcctc 180
tttaagtgtg actgagaatc cgttaaatat gcccttgtag ttttgggggt ccacctgcat 240
acggcatttc actaaatcca ggggaaccac agcagtgtgt gtcagaccac aacttaagac 300
cccaccaaag ccacacagtg cataatactt cgcggagcca aattcacaac tgtactcttc 360
cacggcggcg gctgccaggt tgcgagggcg gcggggctgg cccgtgggac ctggggagct 420
gctgcggagg tccccgagac catcgtgcac canctgcaga tgtggcgtgt tgaagggggt 480
cgcccgcgcc aggtgcgcca cggacga 507

```

<210> 467

<211> 183

<212> DNA

<213> Homo sapiens

<400> 467

```

cctcatgagc taccgggcca gctctgtact gaggtccacc gtctttgtag gggcctacac 60
cttctgagga gcaggagggg gccaccctcc ctgcagctac cctagctgag gagcctgttg 120
tgaggggcag aatgagaaag gcaataaagg gagaaagaaa aaaaaaaaaa aaaagggcgg 180
ccg 183

```

<210> 468

<211> 129

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature
<222> (1)...(129)
<223> n = A,T,C or G

<400> 468
gcggccgcgt cgaccggcgc cgtcgggcnc cgggcccggc catggagctg tggacgtgtc 60
tggccgcggc gctgctgttg ntgntgctgn tgggtgcagtt gagccgcncn gccgagttct 120
acnccaang 129

<210> 469
<211> 243
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(243)
<223> n = A,T,C or G

<400> 469
gcggccgcgt cgacnngcca tggagactgt ggcacagtag actgtagtgt gaggctcgcg 60
ggggcagtg ccatggaggc cgtgctgaac gagctgggtgt ctgtggagga cctgctgaag 120
tttgaaaaga aatttcagtc tgagaaggca gcaggctcgg tgtccaagag cacgcagttt 180
gagtacgcct ggtgcctggt gcggagcaag tacaatgatg acatccgtaa aggcacgtg 240
ctg 243

<210> 470
<211> 452
<212> DNA
<213> Homo sapiens

<400> 470
cctcaagtac gtccggcctg gtgggtgggtt cgagcccaac ttcattgctct tcgagaagtg 60
cgaggtgaac ggtgcggggg cgcaccctct cttcgcttc ctgcgggagg ccctgccagc 120
tcccagcgac gacgccaccg cgcttatgac cgaccccaag ctcatcacct ggtctccggt 180
gtgtcgcaac gatgttgctt ggaactttga gaagttcctg gtgggccctg acggtgtgcc 240
cctacgcagg tacagccgcc gcttccagac cattgacatc gagcctgaca tcgaagccct 300
gctgtctcaa gggctcagct gtgcctaggg cggccctcct accccggctg cttggcagtt 360
gcagtgtctg tgtctcgggg gggttttcat ctatgagggt gtttctctta aacctacgag 420
ggaggaacac ctgatcttac agaaaatacc ac 452

<210> 471
<211> 168
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(168)
<223> n = A,T,C or G

<400> 471
cttctccgct cctttctanga tctccgcctg gttcggncgg cctgcctcca ctctgcctc 60
taccatgtcc atcaggggtga cccagaagtc ctacaaggtg tccacctctg gccccggggc 120
cttcagcagc cgctcctaca cgagtgggcc cggttcccg atcagetc 168

<210> 472
 <211> 479
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(479)
 <223> n = A,T,C or G

<400> 472
 gccaggcgtc cctctgtctg cccactcagt ggcaacaccc gggagctggt ttgtcctttg 60
 tggagcctca ncagttccct ctttcanaac tcactgccaa gagccctgaa caggagccac 120
 catgcagtgc ttcagcttca ttaagaccat gatgatctc ttcaatttgc tcatctttct 180
 gngtggcgca gccctgttg cagcgggcat ctgggtgnca atcgatgggg catcctttct 240
 gaagatcttc gggccactgt cgtccactgc catgcagttt gtcaacgngg gctacttct 300
 catcgagcc ggcgttggtg tntttgctct tgggttctct ggctgctatg gtgctaanac 360
 tgagagcaag tgtgccctcg tgacgntctt cttcactctc ctctctctct tcattgctga 420
 ggntgcagnt gctgagggtc gccttggtgt acaccacaat ggctgagccc ttntctgaen 479

<210> 473
 <211> 69
 <212> DNA
 <213> Homo sapiens

<400> 473
 gagcgatgga gcgtgggtag ggagggtcca cagtgtccac tcgccgtgtg cgaagggtga 60
 ctccgtagt 69

<210> 474
 <211> 155
 <212> DNA
 <213> Homo sapiens

<400> 474
 gccgccactg ccgggagagc tcgatgggt tctctgcgc gccgcccggt gtctggccga 60
 gtccagagag ccgcggcgcc tcgttccgag gagccatcgc cgaagcccga ggccgggtcc 120
 cgggttgggg actgcagggg aaggcagcgg tggcg 155

<210> 475
 <211> 282
 <212> DNA
 <213> Homo sapiens

<400> 475
 ggcttcgacg ttggccctgt ctgcttctg taaactccct ccattcccaac ctggctccct 60
 cccacccaac caactttccc cccaaccgg aaacagacaa gcaacccaaa ctgaaccccc 120
 tcaaaagcca aaaaatggga gacaatttca catggacttt ggaaaatatt tttttccttt 180
 gcattcatct ctcaaactta gtttttatct ttgaccaacc gaacatgacc aaaaacccaa 240
 agtgcattca accttaccaa aaaaaaaaaa aaaggcggcg cg 282

<210> 476
 <211> 434
 <212> DNA

<213> Homo sapiens

<400> 476

```
ctccaggaca gcgctccagct tgggtgctggt gaagacgaag tggagcggat ggttgtagaa 60
acgagtgatg gtgctgagcg gcgctgcagtc ttccgggatcc acgaaggcca agtccttgag 120
gtagagcatg tccacgatgt tggagcgctc ctccctcgta accgggatgc gcgctgaggc 180
gctctgcatg atgctggcca ggacgcccga gtccagcacg gtgctggcgt ccagcatgaa 240
gcagtccttc aggggctga gcacgtctc caggtccgg cagcgcagca cggccttgc 300
gagatcgctg taggggtcgc cgccgcccgc cgccagctcc agcaccgcct cccgcagccg 360
cccgggccgc gccgccagct ccagcagctg cccacgggc agcgcgacgg gcagagtga 420
caggacggcc aggc 434
```

<210> 477

<211> 314

<212> DNA

<213> Homo sapiens

<400> 477

```
ggcgggcgct agctggctcc gggcagctcg gccttggggg ctccggggcc ccgagacgcg 60
gggcgtatga gtggggcggt cgctccacgc ggaagtcgga gcctcctccc ctggataggg 120
tgtacgagat ccctggactg gagcccatca cctttgcggg gaagatgcac ttctgcccct 180
ggctggcgcg gccgatctt ccgccttggg accgcggcta caaggacca aggttctacc 240
gctcgcccc tcttcacgag catccgctgt acaaagacca ggctgctat atctttcac 300
accgttgccg cctt 314
```

<210> 478

<211> 317

<212> DNA

<213> Homo sapiens

<400> 478

```
aacagagtga tcattccagt taagcggggc gaagagaata cagactatgt gaacgcaccc 60
tttattgatg gctaccggca gaaggactcc tatatcgcca gccagggccc tcttctccac 120
acaattgagg acttctggcg aatgatctgg gagtggaaat cctgctctat cgtgatgcta 180
acagaactgg aggagagagg ccaggagaag tgtgccagat actggccatc tgatggactg 240
gtgtccatg gagatattac agtggaaact aagaaggagg aggaatgtga gagctacacc 300
gtccgagacc tcttgggt 317
```

<210> 479

<211> 171

<212> DNA

<213> Homo sapiens

<400> 479

```
aggtgctttg ctatagctg tgacaggtat gccaccaaca ctgctcacag cctttctgag 60
gacaccagtg aaagaagcca cagctcttct tggcgtatct atactcactg agtcttaact 120
tttcaccagg ggtgctcacc tctgccccta ttgggagagg tcataaaatg t 171
```

<210> 480

<211> 65

<212> DNA

<213> Homo sapiens

<400> 480

```
ccccagtg aaggctccca ccctggtaga tgaacagccc ctggagaact acctggatat 60
```

ggagt

65

<210> 481

<211> 207

<212> DNA

<213> Homo sapiens

<400> 481

```

cacagcgtgc tctgcggggt cactccact ttgttagtga tgtggttatc tctcagatg 60
gccagtttgc cctctcaggc tcttgggatg gaacctgcg cctctgggat ctcaaacgg 120
gcaccaccac gaggcgattt gtgggccata ccaaggatgt gctgagtgtg gccttctcct 180
ctgacaaccg gcagattgtc tctggat                                     207

```

<210> 482

<211> 319

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)... (319)

<223> n = A,T,C or G

<400> 482

```

cacactgtgc ccttccagtt gctggcccgg tacaaggcc tgaacctcac cgaggatacc 60
tacaagcccc ggatttacac ctgcgccacc tggagtgcct ttgtgacaga cagttcctgg 120
agtgcacgga agtcacaact ggtctatcag tccagacggg ggctttggt caaatattct 180
tctgattact tccaagcccc ctctgactac agatactacc cctaccagtg cttccaaact 240
gcacaacacc cnagcttntc cttccagnac aagagggtgt cctggtcctt ggctacctc 300
cccaccatcc agagctgct                                     319

```

<210> 483

<211> 233

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)... (279)

<223> n = A,T,C or G

<400> 483

```

acaggccccag tggcgcctag ccttcagctg ctgggctctc ccgagcctgc cttagcccat 60
acaaccactt gatcacgcgg gcattgcgct ccaccaccga cagcccatag ggaacgcgct 120
cccgggccccg ctctcaaca gtcaccgagc tgccggcgga gcagccccct tcagagctgc 180
ccggcccagc actgggccct gccagggaca cnatatccga gctggcccgt gcc 233

```

<210> 484

<211> 194

<212> DNA

<213> Homo sapiens

<400> 484

```

agagcccttg ctggggggtg cctgggagat ggggtaagaa gagctttcat ttgtctggta 60
gatagatagc atgtaagggg gtggttgtcc caggaggcag ctgctgacag gtttctaca 120

```


cacagccccg gactgtgttg cctgggtgct cattcagaga ggggctatca tctgggagcc 180
tgtgcccctg ggtc 194

<210> 485

<211> 67

<212> DNA

<213> Homo sapiens

<400> 485

tccatatcca ggtagttctc caggggctgt tcattctacca ggggaggagc ctcccactgg 60
gggaagt 67

<210> 486

<211> 70

<212> DNA

<213> Homo sapiens

<400> 486

taccgagtca accttcgcac acggcgagtg gacactgtgg accctcccta cccacgctcc 60
atcgctcagt 70